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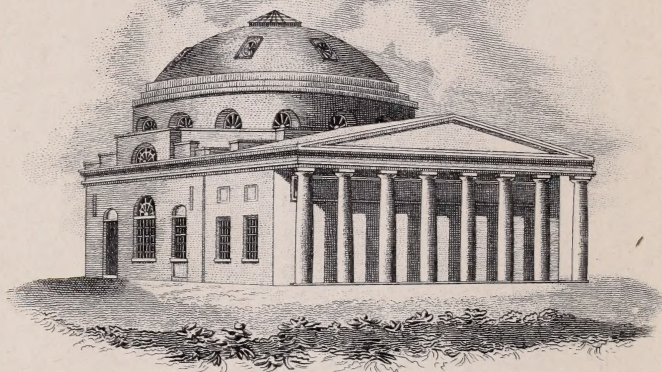
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THE
ECLECTIC REPERTORY,
AND
ANALYTICAL REVIEW,
Medical and Philosophical.

EDITED BY A SOCIETY OF PHYSICIANS.

.....Apis matinae

More modoque.—HOR.

Nullis unius disciplinae legibus adstricti, quibus in philosophiâ necessariò paremus, quid sit in quaque re maxime probabile semper requiremus.—CIC.

VOL. VI.

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THE
ECLECTIC REPERTORY
AND
ANALYTICAL REVIEW.

VOL. VI.

JANUARY, 1816.

No I.

SELECTED PAPERS.

Observations on the Pathology and Cure of Rheumatism.

By WILLIAM BALFOUR, M. D. Edinburgh.

Tantum, quantum quisque potest, nitatur.—CIC.

[From the Edinburgh Medical and Surgical Journal, for April, 1815.]

SYDENHAM was the first who favoured mankind with a distinct and accurate history of rheumatism. Before his time it seems to have been confounded with gout; since that period it has maintained its ground as an idiopathic disease, and has long been as well understood as any other, the proximate cause of which can be matter of conjecture only.

Concerning the proximate cause of rheumatism various opinions have been entertained. Dr. Macbride and others imagine it to consist in a peculiar acrimony; others in a lentor of the fluids; and Dr. Cullen supposes it to be, in the *acute* species, a phlogistic diathesis of the blood, with a peculiar affection of the muscular fibre; but in the *chronic*, “an atony both of the blood-vessels and of the muscular fibres of the part affected, together with a degree of rigidity and contraction in the latter, such as frequently attends them in a state of atony.”

That in *acute* rheumatism a phlogistic diathesis of the system prevails, admits not of doubt, and that there is an affection of either the muscular fibre, or of the cellular membrane, or

of both, is equally certain. An atony, in the *chronic* species, of the muscular fibres, or of the cellular membrane, must also be admitted. But which of these it is, the muscular fibre, or cellular membrane, that, in either species of the disease, is primarily affected, is a matter not quite so manifest. To ascertain this point with any degree of clearness, a review is necessary of the structure and functions of these organs themselves; and I am not without hopes of being able to adduce facts, in the history of cases hereafter to be detailed, which render it highly probable that there is in rheumatism, *chronic* as well as *acute*, an affection of the *aponeurosis* of the muscles, and perhaps of the whole cellular substance connected with them, which forms a principal part of the proximate cause of the disease.

The cellular membrane abounds every where in the human body. It covers the whole, and connects every part. The celebrated Haller, indeed, considers it as constituting the greater part of the whole mass. All the blood-vessels receive a coat from it, from the *aorta*, where it emerges from the heart, to the minutest capillary that enters a tendon.

The nerves are composed of fasciculi, and these again of filaments or fibrillæ. The cellular membrane furnishes a sheath to every nerve, a covering to every fasciculus, and every filament is a tube of the same substance, filled with medullary matter; and on the parieties of this tube are ramified, and are supposed to secrete the medullary substance it contains, those capillaries, of exquisite minuteness, which are continuations of the arteries seen to penetrate the fasciculi. A muscle, whatever be its length, breadth, or thickness, is not a mass of homogeneous substance, but, like the nerves, is formed of many fasciculi. These fasciculi are themselves composed of fibres so delicate and numerous, as to be divisible *ad infinitum*. At all events, their minuteness is such as to have hitherto set at defiance the patient investigations of the most accurate physiologists to discover their ultimate division. But, incalculably minute as are these fibrillæ, they are supplied with vessels and nerves, and inclosed in a cellular sheath, upon which perhaps the vessels and nerves terminate. They are also connected to each other by means of cellular membrane, to form the fasciculi, which in their turn, are enveloped in a common sheath of the same sub-

stance, similar to that which covers the muscle, and separate it from all other parts.

The structure of the cellular tissue is extremely vascular. Mascagni considered its laminæ as consisting entirely of lymphatics; Ruysch, by his injections, reduced the membranes and cellular substances into a net-work purely arterial, the texture of which was so close as to leave no observable space for any other vessels. Hence he concluded, that capillary arteries formed the basis of membranous and cellular tissues. The truth, however, lies between the opinions of these two celebrated physiologists. For, if one set of vessels only are injected, they become distended, compress and conceal the neighbouring parts; and we know, that lymphatic absorption and arterial exhalation take place from all the internal surfaces, by which is proved the existence of both arteries and absorbents in membranes and cellular tissue.

From these data it may justly be inferred, that the functions of the cellular membrane are not merely mechanical; that it does not merely cover, connect, divide, suspend,—but that it serves a purpose in the animal economy, essential to the healthy functions of the parts on which it is so liberally bestowed. It is not consistent with common sense and reason to suppose, that a substance formed as is the cellular tissue of vessels, which carry on, if I may so express myself, the business of life in every part of the body, can remain sound, when the muscular fibre is affected with disease. It is infinitely more rational to conclude, that the affection of the muscular fibre is a consequence of the affection of the cellular substance, whose functions seem, from its universal diffusion, subservient to those of every other organ. For if, as we have seen, the cellular membrane is formed of capillary arteries and absorbents, the balance between their functions being in any degree upset, must produce corresponding phenomena. Thus, if the absorbents of a muscle carry off more than the arteries deposit, permanent contraction, in every direction of that muscle, must be the consequence.

It is well known, that diseased appearances are often confined to the cellular membrane, and that, when this is the case, the organs or vessels which it surrounds exhibit a morbid action.

It is likewise ascertained, from ample observation and experience, and it goes far in countenancing our theory, that, however insensible the tendons and aponeuroses of muscles are in their sound state, injuries and morbid affections of these parts are accompanied with pains unusually severe. Thus, inflammation of the integuments, and of the subjacent cellular substance and *fascia* of the fore-arm, sometimes the consequence of blood-letting, occasions not only the most inexpressible sufferings, but not unfrequently renders the arm contracted and rigid for life.

But the knowledge we possess of the functions of the cellular membrane, goes a great way in explanation of the phenomena of rheumatism. We know that it officiates at once as a *fascia*, a ligament, a mucous gland; and that by it is secreted all the fat and oily substance that is deposited about the joints, upon, between, and in the interstices of the muscles.

In the first place, then, the *fasciæ* of the muscles confine them to their situation parallel with the bones. Were that not the case, a muscle could not contract at all. Destined to act in a certain sphere, if that sphere is lessened, a muscle will either not contract, or its contraction will be of no use. Suppose, for instance, the *biceps flexor cubiti*, the *Sartorius*, any rectilineal muscle, was deprived of its natural bandages that confine it to its situation, what appearance would it exhibit in a state of contraction, were it possible to contract at all in such circumstances? A muscle, in contracting, becomes shorter, thicker, harder, rough, and vibrates like a cord when put upon the stretch. It is evident, therefore, that unless a muscle were bound by its *fasciæ* or *aponeuroses*, its contractions would either be very limited, or, in contracting, it would start from its place like the string of a bow. It follows, that a perfect sound state of the *fasciæ* of muscles is necessary to their vigorous action; and on the supposition of there being in rheumatism a morbid affection of the *aponeuroses* of the muscles, are explained the pain and difficulty of motion, in the first stages of the disease at least, of a limb affected with that disorder.

In the second place, the doctrine of a morbid affection of the *aponeuroses* of, and cellular substance connected with, the muscles, accounts satisfactorily for the debility of the latter,—their

permanent contraction,—their rigidity in *chronic* rheumatism. Were it not for the cellular membrane lubricating the surface of the muscles, it is impossible they could move upon each other; they behaved to contract simultaneously, and to the same degree, otherwise inflammation and adhesion could not fail to be the consequence of their friction upon each other. If, therefore, there should be, from a morbid state of the cellular membrane, a deficiency of that lubricating substance which facilitates the motion of the muscles, rigidity and pain upon motion must in proportion be the consequence. Not only so, if there is a deficiency of the fatty substance, which, in a state of health, is found in a greater or less quantity, deposited between, and in the interstices of the muscles, they must become shorter in proportion,—their fibres must approximate nearer to each other in every direction,—for the muscular fibre is not a line of continuous substance extending from origin to insertion; it is made up of many pieces whose ends are connected with each other, laterally, by means of vessels, nerves and cellular substance. What, therefore, has hitherto been deemed a wasting of the muscular fibre, may, with greater propriety, be considered a deficiency of those cushions which give plumpness to every muscle, and symmetry to the whole. Not but that there is a wasting and contraction, or absorption of the molecules of the muscular fibre itself to a certain degree, and also an affection of the nerves of a part affected with rheumatism. For if we reflect, that the fasciculi and fibrillæ of both the nerves and muscles are enveloped in cellular membrane, we must infer, that the apposition of muscular, and the secretion of nervous substance, are performed by the capillary vessels of that membrane. If, therefore, the functions of these vessels are impaired, the parts they supply must suffer in their turn. But mere disuse will produce emaciation of a limb. There is no fact in physiology better established, than that action is necessary to circulation, and circulation to nutrition. These are, indeed, matters of daily experience. Emaciation of the muscles must therefore be considered more as a consequence than a cause of rheumatism.

In the third place, the effusions that sometimes take place into the sheaths of the tendons, is a proof that the cellular mem-

brane is principally affected in rheumatism. I have seen effusions of this kind occur as the first symptom of the disease; and I have an instance of it in a gentleman who is presently under my care. In this case, a circumscribed tumour, without the least previous pain, appeared in the course of the tendon of the ring finger of the left hand. Unable to explain the cause, the gentleman took little or no notice of it for some days, when it became the centre of pains which shot alternately to his wrist and to the points of his fingers, with frequent and most painful catchings of the tendon on which the tumour was situated. These pains and spasms occurred chiefly in the morning when warm in bed; and in a short time, the patient became unable to grasp any thing with his hand with any degree of firmness. When he applied to me, I desired him to grasp his left hand firmly with his right, pressing the thumb of the latter upon the *aponeurosis palmaris* of the former, and, in that situation, to try what command he had over his fingers. He could instantly use them with the utmost ease and with the greatest vigour. I next directed him to lay firm hold of the wrist of the affected hand with the other, and in this way to try the effect a bandage would produce. This gave him a more complete command still of the whole hand, and enabled him to do with it what he pleased. A clearer proof that the *annular ligament* was deficient in power, cannot be adduced. I endeavoured to persuade this gentleman to wear a bandage about his wrist, till a radical cure was obtained; but, highly amused with the success of the above experiments, and believing that he has the means of relief at command, he satisfies himself with the use of the flesh-brush, and, as occasion requires, with the repetition of these experiments, which never fail of the desired effect. Now, if we reflect that parts of similar structure, though far distant, are often observed to sympathize, we cannot wonder that the tendinous aponeurosis of the muscles, and all its processes, which are of the same nature and structure with the sheaths of the tendons, and indeed but a continuation of the same substance, should be simultaneously affected with them.

In the fourth place, from the fact that the same cause affects different parts of similar structure in different individuals, and in the same individual, perhaps, at different times, we might

judge, *a priori* almost, that it is not the muscular fibre, but the cellular membrane that is peculiarly affected in rheumatism. Thus, exposure to cold produces in one person catarrh, in another pneumonia, in another pleuritis, in another rheumatism, according to idiosyncrasy. Now, the parts affected in catarrh, pneumonia, pleuritis, however they may differ in density, are of the same nature with the tendinous aponeurosis of the joints and muscles, and the cellular substance interposed between their fibres. It is, therefore, not illogical to conclude, that it is the cellular membrane, not the muscular fibre, that is primarily and peculiarly affected in rheumatism. Not but that there must also be an affection of the muscular fibre; for, as has already been observed, the connection betwixt the two, the cellular substance and muscular fibre, is so intimate, that we cannot well conceive the former to be in a morbid state, and the latter remaining altogether sound. But we must repeat, that this affection of the muscular fibre is secondary, and therefore cannot be considered as constituting a proximate cause.

In the fifth place, Dr. Cullen has remarked, that the affection of the muscular fibres attending rheumatism, seems to explain why sprains and spasms produce rheumatic affection. That sprains and spasms frequently terminate in rheumatism, is an acknowledged fact. But this fact is no way explicable on the supposition of a peculiar affection, in that disease, of the muscular fibre. For it is not the muscular fibre that chiefly suffers in these accidents. The muscles are capable of acting with amazing force. They sometimes rupture their natural bandages; lacerate their tendons; and even the bones themselves have been broken by the violence of their action. It is not probable, therefore, that such powerful organs will be the first to yield in such a trial of strength as takes place in sprains, between them, their tendons, and tendinous *aponeurosis*. The fact is, that in cases of sprains, patients uniformly point to the situation of some *aponeurosis*, tendon, annular, capsular, or interosseous ligament, as the seat of debility and of pain. No conclusion, therefore, can be more natural, than that rheumatic affections arising from such accidents, are not affections chiefly of the muscular fibre, but of that substance which is of the same structure with the parts originally affected.

Finally. It would appear from the history of rheumatism, that the proximate cause, of the *acute* species at least, of that disease, is an affection of the aponeurotic expansion of the tendons and membranous covering of the joints. This appears from joints being first affected with pain, and its consequences. In many instances, indeed, the pain is confined entirely to the joints. At other times the muscles come to be affected with pains shooting along their course from one joint to another. But is it by the muscular fibre that these pains are propagated? Is it not more consonant with the other phenomena of the disease, to suppose that these pains are occasioned by the oscillation of the contents of the extreme vessels? It is ascertained, that when red blood is, in consequence of inflammation, forced into vessels that do not naturally admit it, resolution is effected by that blood taking a retrograde course, till it comes to vessels of sufficient calibre to transmit it; in inflammations of the eye, for example, and of the *pleura*. In the latter, no symptoms of inflammation have appeared, upon dissection, in cases which, previous to death, exhibited every symptom of it; a circumstance that can be explained only on the supposition of the reflux of the blood, after death, from the part affected. From this view, it is more than probable, that vessels so extremely minute, and so very irritable and contractile as are the capillaries of the *aponeurosis* and cellular membrane, are so affected, in rheumatism, as to be incapable of transmitting, as in health, the colourless part of the blood; which therefore, by its oscillations and pressure against the parietes of its vessels, occasions those pains, hitherto believed to be propagated from joint to joint, by the muscular fibre.

Independent of the primary affections of the joints, the very nature of the remote causes themselves renders it probable, that the proximate cause of acute rheumatism is an affection of the membranes connected with the muscles. Sudden changes of weather, the application of cold to the body when warm, cannot but affect those parts soonest, and to the greatest degree, that are most exposed to their operation; and the parts so exposed are, next to the extreme vessels of the skin, the aponeuroses of the joints and muscles. The powerful muscles of the larger joints, the most common seat of rheumatic affections, are

necessarily furnished with *fasciæ*, strong and dense, and whose vessels must, of course, be extremely minute. It is, therefore, *a priori*, to be expected, that they must suffer constriction from the application of cold to the body, sooner than vessels of less irritability and contractility, but of larger calibre.

But *chronic* is often the consequence of *acute* rheumatism. Nothing, therefore, can be more evident than that what constitutes the proximate cause of the latter must also form that of the former. For the only difference betwixt the two *species* of the disease consists in this, that the *acute* is accompanied with fever, whereas the *chronic* is free, or nearly free, from it. It necessarily follows, that, if a phlogistic diathesis of the blood, amounting to fever, and an affection of the *aponeurosis* and membranes of the joints and muscles, constitute the proximate cause of *acute* rheumatism, the *chronic* species of the disease must also acknowledge for its proximate cause, an affection, not different in nature though it may be in degree, of the same membranes and aponeuroses.

I was led into these speculations, near as they may approach, or far as they may be from the truth, by what occurred some time ago in my own person, and which I have often since practised upon others, with almost uniformly the same good effect. Having been seized with a rheumatic affection of the left shoulder, chiefly in the course of the *deltoid* muscle, the pain at times, but especially towards morning, when warm in bed, was so severe as to make me cry out. Desirous, on one of these occasions, of moving my arm, a task to which its own powers were unequal, I grasped it firmly with my right hand, about the middle of the pained muscle. To my surprise and high gratification I was instantly relieved from pain; and while I thus held my arm, I could do any thing with it I pleased without farther aid from my right hand than mere compression. This, therefore, was the remedy, the only remedy to which, on all future occasions of the kind, I had recourse, and it never was employed without success.

I now began to think, that surely the muscular fibre was not the seat of pain in rheumatism; not even to those pains occasioned by motion. If it were, how could mere compression enable it to contract with all its pristine vigour? I observed,

moreover, that when, during the paroxysms of pain, I endeavoured to move my arm, the moment the belly of the muscle began to press on the *aponeurosis*, I was obliged to stop; but as soon as artificial resistance was opposed to it, the muscle could perform its functions with the utmost ease. A more decisive proof, I think, cannot be adduced, that the pain and difficulty of motion of a limb, afflicted with *chronic* rheumatism, are not referable to the muscular fibre. It may occur to the reader as it did to me, that the sudden relief from pain which I experienced, is to be explained on the principal of ligatures interrupting the progress of pain, or any other sensation, along the course of the nerves, as in some cases of *epilepsy*, *whitlow*, &c. But this by no means accounts for the fact. For I always remained free from pain for a considerable time after compression was removed. I find, upon inquiry, it is no uncommon thing for people afflicted with rheumatism, to grasp and nibble a pained joint or muscle, for the purpose of obtaining even temporary relief, which they never fail to procure in greater or less degree.

A very pertinent instance of the effects of compression occurred to me, on the 14th of November last. A woman twenty-seven years old, and very much emaciated, complained of a rheumatic affection in her left shoulder, which had rendered her arm next to useless for many weeks. The pain was confined to the *scapular* portion of the *deltoid* muscle. She could by no means raise her arm to a right angle with the trunk of her body. She could not put her hand to her mouth, far less touch with the points of her fingers the crown of her head. Placing her before me on a form, I made gentle pressure with the palm of my hand on the pained part, desiring her, at the same time, to raise her hand to the crown of her head. This she could not do. I increased the pressure, and the motion of the arm became in proportion free. This process was continued till she could move her arm in every direction, with little or no uneasiness. What surprised the patient most was, she in a very short time became capable of using her arm, with nearly as much freedom without, as with the pressure.

How are these facts to be explained? Thus, in my opinion. The *aponeurosis*, and perhaps the whole cellular membrane of

parts affected with rheumatism, is in a state of morbid sensibility; this state of sensibility arising from a preternatural distension of its vessels. Bandages and pressure, by affording support, take off tension, and facilitate motion, which in its turn promotes circulation. The vessels being in this way unloaded, morbid sensibility is diminished; and if the bandages or pressure be often enough applied, or for a sufficient length of time, the vessels and membrane recover their tone. It is evident, therefore, that in proportion as these effects are produced, the motion of a part formerly rigid, will not only become free, but remain so. On this principle it was, that the motion of the patient's arm remained free after the removal of the pressure; on this principle is explained the good effects of friction, &c. in rheumatism. If a person could always move a limb affected with this disease, little more would be necessary to the cure of it. But as that is, in many instances, impossible, and in all, attended with difficulty, in a greater or less degree, bandages or pressure, according to circumstances, by facilitating motion, become, if not of themselves a complete cure, at least most powerful auxiliaries; of which, whoever once makes trial, will, when circumstances require, ever after avail themselves.

I did not see this woman again till the 10th of December, (the distance of near a month from the time she called upon me,—a month too of the most horrible weather that can well be conceived,) when I called at her house to ascertain if the cure was permanent. She told me, she allowed the bandage which I applied, to remain till quite dirty, and that when she removed it to have it washed, she found she could do perfectly well without it, and in my presence performed, with the utmost facility, all the motions of which the arm in its soundest state is capable. In one word, this woman's case is an instance of a severe rheumatic affection, of many weeks' standing, being immediately, completely, and permanently cured, by pressure alone.

On the 21st of October last, I was called to a girl of fourteen years of age, whom I found sitting in a warm room, before a large fire. Her skin was hot, face flushed, and pulse at ninety; all which I was disposed to attribute to the warm regimen she had been so carefully observing. I desired her to remove to a

distance from the fire. She told me she could not move, on account of rheumatic pains, reaching from her ankles to the middle of her thighs. This account I soon found to be correct: for when, in consequence of my pressing her, she made an attempt to rise, she was forced to cry out most bitterly, so that I saw her limbs were totally immoveable. I told her I would make her walk through the room, without pain, before I left her. So much difficulty was experienced, however, in removing her from the place where she sat, that I began to suspect I had put my credit to too great hazard, and therefore endeavoured to pass off, as a joke, the assurance I had given of instant relief. Having accomplished the removal of the patient to a proper situation, I applied a roller of flannel, with a degree of tightness which she could easily bear, to both limbs, beginning at the middle of the thighs, and continuing it downwards over the feet. I now requested she would make an attempt to walk. To this she consented, on condition of being indulged with another person's arm. I allowed her to touch gently her aunt's shoulder. The girl rose up and walked through the room, stiffly to be sure, but without complaint. I ordered her to be put to bed, and as she seemed to labour somewhat in her breathing, was desirous of taking a little blood from her arm. This was peremptorily resisted by her aunt, the lady of the house, on the score of the patient's youth. It was in vain I represented, that, though bandaging the limbs was a powerful auxiliary, it never could supersede the diligent use of other remedies generally employed in the cure of rheumatism; above all, that it could have no influence whatever on febrile symptoms. Next day the patient's general health was much the same; the pains as bad as ever. I suspected the cause, and soon found the bandages were hanging loose. I immediately replaced them with the same good effect as before. With the exception of some laxatives, this girl got no other remedy, and the pains were, notwithstanding, put to flight in a few days. A sister of this girl, aged eighteen, soon after my patient got better, was seized in like manner, all over the inferior extremities, with rheumatic pains. Without calling any medical aid, she had recourse to the *bandages*, which had the same happy effects with her as with her sister.

A lady, upwards of forty, who has for many years been a martyr to rheumatism, on hearing "I had found out a cure for it," applied to know what it was. I readily informed her that the application of *bandages* or *pressure*, according to the situation of the parts affected, with a view to give relief from present pain, and to facilitate motion, was the improvement to which I laid claim; assuring her, that whoever made trial of the remedy, would find their account in it. This piece of information appeared to her so very frivolous, that she never returned an answer. I met her on the street some weeks afterwards, when I inquired if she had made trial of the *bandage*? She said she had tied a bit of flannel above the knee joint, but as she had had no return of the pains since I saw her, she could say nothing about it. I plainly saw "my cure" was too simple, cheap, and of easy application, to gain the least credit with this lady. This conversation took place about the beginning of November last, and I was determined this patient should speak to me before I spoke to her again on the subject. She did so. On the 1st of December I was abruptly stopped by her on the street, when she hastily exclaimed, "It will do, for had it not been for your *bandage*, you had not met me to-day. I was seized yesterday morning with my pains, in a most violent degree, when I was glad to have recourse to the *bandage* as you directed, which gave me instant relief, and I was able to walk abroad with the utmost ease, a thing I could not otherwise possibly have done." This I considered a great triumph over prejudice; and as the patient is a sensible woman, and of unimpeachable veracity, her account may be relied on. This I hold to be an interesting case in every point of view, and quite decisive of the immense utility to be derived from the use of bandages, to those afflicted with rheumatism. That a lady for many years afflicted with rheumatism, to such a degree as to render her permanently somewhat lame of one leg, and all the year over more or less subject to pain, which in the winter season became at times so severe as to confine her, if not to her bed, at least to her room, should, from the first trial of the *bandage*, in one of these paroxysms, be not only relieved from pain, but enabled to walk abroad in cold damp

weather, with a firmer step than she had done for eight years before, is a thing that speaks for itself.

On the 10th of December I again met this lady on the street, when she accosted me in these words: "I am not near so lame now." This was a piece of information that, I confess, I did not expect. I would have been quite satisfied with being told that she had experienced considerable benefit from the bandage, in the way of preventing pain. The ten days, it is material to observe, that had elapsed since she first applied the *bandage*, consisted of weather the most inconstant and severe. I therefore now put it seriously to this lady, if she was convinced that the application of the *bandage* had warded off the pains with which she was threatened on the 1st of December? If she believed the strength her leg had recovered was to be ascribed to the *bandage*? If, from what she had experienced, she believed that *bandages* would be found a powerful remedy for rheumatism? All these questions she answered most decidedly in the affirmative.

On the 15th December, William Graham, aged 32, a private in the Cumberland militia, complained of violent *lumbago*, which rendered him unable to mount guard, and he was unwilling to be sent to the hospital. On examining the part affected, found he wore a broad *bandage* round his body. This he had been accustomed to do, but said he experienced from it no benefit to his back. I asked his pocket-handkerchief, which I formed into a compress, and laid it on the part affected, applying the *bandage* over it as tight as he could bear it. On enquiring how he felt, he replied, "Perfectly at ease. I feel a want supplied, and I can turn myself any way I please with perfect freedom." He went to bed quite well, but in the morning found himself much worse. I saw him again on the 16th, about three o'clock afternoon, when I asked him if he had laid aside the *compress* that his pains had returned? He said he still wore the *compress*, and experienced from it so much benefit, that without it he could not walk at all. On the 15th I omitted to examine his pulse, which I now found at 100. I therefore immediately took twenty ounces of blood from his arm. This took off the phlogistic diathesis of the sys-

tem, and the compress, which, as the pain had extended, I ordered to be enlarged, completed the cure.

In the first week of January, Mrs. M. a lady about 36 years of age, complained of severe pain in the left lumbar region, for which she had been advised to have blood let. On applying to me, I recommended a trial of a *compress* and *bandage*. Having never heard of such a mode of cure, she appeared at a loss whether to take my advice as a joke or not. On assuring her I was serious, she promised compliance as soon as she got home. I insisted on the trial being made immediately; and as I had been setting a fractured arm just before she came in, there was a piece of flannel lying in the room, of which I made a *compress*, directing her to lay it on the part affected, and to make use of her handkerchief for a *bandage*. When I returned to the room I purposely introduced another subject of conversation, that what observations she might make on the mode of cure we had adopted should come spontaneously from herself. Accordingly, I soon observed her moving the trunk of her body, without having received any directions from me to that effect, backwards, forwards, and sideways. I asked her what she meant by so doing. She said the pain was gone, which yet she could scarcely believe, and that to ascertain the fact, she was practising those motions which she dared not attempt before the *compress* and *bandage* were applied, but which she could now do with ease. Next day the pain struck her in the right lumbar region, from which also it immediately removed, on application to the part of the *compress* and *bandage*.

When I relate such instances of the immediate and great good effects of *compression* in *lumbago*, candour and truth demand the acknowledgment, that I have met with several cases in which that mode of treatment completely failed of success. The superficial observer, alone, however, will from hence conclude against the utility of the practice; for the muscles of the loins are not all situated on a plane. Some of them are superficial, others deep seated. Compression may affect the former; it cannot the latter. To deny, therefore, the utility of bandages in the cure of rheumatism, because cases occur which admit not of compression, would be as unscientific as to say, that, because blood-vessels are sometimes ruptured or wounded,

which, from their situation, it is not in the power of man to coerce, Ambrose Paré, in introducing the tying of arteries in amputation, is not the author of the most important improvement ever made in the operative branch of the healing art; or, because we meet with ulcers so vitiated as to admit of being cured by no mode of treatment, that the use of bandages, as introduced by Mr. Baynton for the cure of old ulcers, is not the most valuable improvement that medical surgery has received in modern times. *Cinchona* does not always cure intermittent fever, nor mercury syphilis. But would any man be so mad as to reject these remedies as not generally to be depended on, for the cure of these diseases?

On the 16th January, —————, residing at Cramond, came to consult me about a rheumatic affection, of many years' standing, in his left haunch. His knees and thighs had also been affected, and are still feeble, but free from rigidity and pain. Walks with a timorous irresolute step, the one foot often involuntarily kicking the other. I applied a bandage to both knees, beginning a little below, and carrying it a little above the joints. This gave him a command of his limbs, he said, to which he had been a stranger for many years. His principal complaint, however, was situated immediately under the crest of the left *ilium*. As soon as I ascertained this, I was sure of being able to afford him relief; for the smooth surface of the bone I knew would present an equable resistance to pressure from without. I began, therefore, with desiring the patient to perform the various motions of which the trunk of the body is capable in its sound state. But this was a task to which he was altogether unequal. His body, indeed, had been confined to a prone posture for a great length of time. He could tie the shoe of his right foot with ease, but could not reach farther than the middle of the left leg. I put him, therefore, in this position; desiring him to point, at the same time, to the spot that checked his stooping farther. This done, I pressed my hand against the part affected, and desired him to put his hand down to his foot. This he did at once, and with facility, to his own astonishment, and to that of his son-in-law, who looked on. Having several times practised this, and other motions of which he was formerly incapable, I applied a compress and bandage,

formed of such materials as were at hand, and sent him away rejoicing.

On the 9th January, I was called to Mr. B. a gentleman traveller, lodged in the Black-bull inn, who informed me he had been arrested on his journey, for four weeks before, by acute rheumatism, and that he had been attended by ———. His father, who had come from Whitehaven to see and carry home his son, having heard, in the town, of the successful application of bandages in the cure of rheumatism, mentioned, on his return to the inn, the circumstance to the patient, who took no rest till his father brought me to him. I stated the impropriety of my interfering with the patients of another practitioner in his absence. But the young gentleman told me, “he had not seen his doctors for some time; that he conceived they did not intend to visit him any more, he having been out; and, at any rate, he was not to be deprived, on account of any trifling piece of etiquette, of the benefit of the *bandages*, if benefit was to be obtained from them.”

This gentleman I found convalescent, but complaining grievously of pain in his left hand, which was also much swelled; of pain and stiffness of the left elbow; of pain and weakness about the left shoulder; of pain and rigidity of the muscles of the back of the neck; of weakness and pain upon motion, all along the spine; and of pain and stiffness of the left knee, the outside of which he could scarcely suffer to be touched.

I began with desiring the patient to show me how he could walk. He moved and threw his weight upon the left leg, slowly and timorously, as if afraid to trust himself upon it. But no sooner was a bandage applied, than he planted his foot firmly, and walked with great freedom, declaring that, in respect of his knee, he felt quite a different man. I next proceeded to examine the state of his left arm, and found the range of motion it possessed very circumscribed indeed. He could not even put his hand to his mouth. Upon application, however, of a *bandage*, from the points of the fingers to the elbow-joint inclusive, he could do it freely. On account of the patient being very much fatigued, I did nothing at this call to the shoulder, farther than grasping it with one of my hands, in

order to show him what could be done. Upon this, he moved his arm with great facility in every direction.

January 10th.—Passed a good night, having slept from eleven to five without interruption. Pain of the left hand and knee greatly abated; in other respects as before. Removed the *bandages* and ordered the diligent use of the flesh-brush, for a considerable time, to the parts affected, which was extremely grateful to the patient. Applied the *bandages* as before, and also to the left shoulder, making a turn under the right, by which two breadths of the *roller* were made to press upon the back of the neck, a circumstance that also gave much pleasure and satisfaction.

January 11th.—Pain of the left knee, wrist, and elbow almost gone. Muscles of the neck also much relieved. Swelling of the left hand greatly abated. Motion of the left arm entire, and much more vigorous. Omit the *bandages*.

January 12th.—Has slight pain and stiffness to-day, in both ankles. In other respects improving. Swelling of the left hand entirely gone. Applied *bandages* to both ankles.

January 13th.—Was out yesterday; but says the pain and stiffness of his ankles were such, that he could not have walked at all without the *bandages*. Is resolved to have a set of them to carry along with him. This, I think, sufficiently indicates the opinion he entertains of their utility. It is, indeed, in such cases as this, that the pre-eminence of *bandages* in the cure of rheumatism is most conspicuous. Let us suppose that *bandages* had not been applied to this gentleman's ankles,—he must of course have remained at home; let us suppose that I had confided to rubefacients and flannel, for the removal of his pains, when would the desired effect have been produced? in a day? a week? a month? No man can answer these questions. One thing only is certain,—that the longer a patient in such circumstances is confined to the house, the longer is his general health of being restored. But no sooner were the *bandages* applied to this gentleman's ankles, than he was enabled to walk abroad. The consequence was, he returned with an appetite greatly improved, and with a universal glow and moisture of the skin, which are most successfully promoted

by action in the open air, and of more real benefit to a *rheumatic* patient, than all the sudorifics in the world.

On the 15th of December last, I was called to a young man, Simon Stewart, at the west end of the town, whom I found in a condition that almost beggars description. Pale, ghastly, emaciated, he had been a martyr, for three years uninterruptedly, to rheumatism in its most cruel forms. His fore-arms, half bent, felt like two boards, and were so immoveably fixed in the prone position, that he could not see the palms of his hands till they were elevated above his eyes. Had no motion at the wrists; the right *carpus*, especially, was pained, swelled, distorted, and the command he had over his fingers was so small, that for a considerable time he was under the necessity of being fed by others. In the left knee, there was great effusion and pain; it had very little flexion and extension, being almost fixed in the half-bent posture. Both his ankles were pained, swelled, and distorted. He had not been able to stand even, on the soles of his feet, for the last twenty-three months. Sometimes, indeed, within that period, he had walked a little, but he did so by turning his heels outwards, and resting his weight on the outer edges of his feet. In this way he would crawl from his bed, along a range of chairs, to the fireside. Such was this man's situation when I first saw him. At the beginning of his illness he had declined going to the hospital, where he was offered the warm-bath free of expense; but had, notwithstanding, been attended by a host of medical men in succession; one of these, in particular, had done every thing for him that skill could devise, or philanthropy suggest, but, long before I was called in, had also given him over as incurable. Having satisfied myself as to the state of the patient, I applied a roller of flannel to the arms, from the wrists to the elbow-joints inclusive; in like manner to the knee; and, lastly, to both ankles. This done, I desired the patient to come out of his bed and dance. He descended very slowly and timorously, but getting his feet to the ground, and finding he could stand, he at last stepped out, declaring, that if his knee had not been bound so tightly he could have leaped the height of his stick.

December 21st.—Has had great pain in the knee, especially in the night time, ever since the *bandage* was applied, which

has therefore been laid aside. Some rotatory motion of the fore-arms. Apply a compress of flannel to the *aponeurosis plantaris* of the left foot.

December 25th.—Rotatory motion of the fore-arms increasing; motion of the left wrist very considerable; had none at the beginning. Some pain among the *tarsal* bones of the left foot, but can stand on both soles. The *compress* to the left foot a great improvement to his walking; to which, he thinks, there is no obstacle but the knee.

December 28th.—Fore-arms more plump in their appearance, and the skin of a more kindly feel. Walked from his bed to the fire-side, without a stick, or any other support. This is the first time he has done so under my care. Feet quite the natural shape, and sets them down without fear or dread. No impediment to his walking abroad but the knee. Can turn his hands half-way to the supine posture.

R Muriat. ammoniæ, \mathfrak{z} i.

Acid. acetos. commun. \mathfrak{z} xii. Solve.

To be rubbed with great diligence all over the knee-joint, twice a-day.

December 31st.—Circumference of the knee diminished three-eighths of an inch. Attempted to walk without the bandages about his feet and ankles; could not set down his feet with confidence and firmness. Applied the bandages, when he walked with the utmost ease, knee excepted.

January 5, 1815.—Had pain among the tarsal bones of the right foot night before last;—gone to-day. Thermometer yesterday and to-day at 40; weather hazy and damp. What is the reason that people subject to rheumatism are so much affected upon the change of weather? I firmly believe it is owing to sympathy between the parts affected and the lungs. This is no extravagant idea. According to our theory, the white parts are the chief seat of rheumatic affections. Now, a great proportion of the lungs consists of cellular substance. Besides, we every day observe sympathies much less explicable than this: between the parotid gland, for instance, and the testes; the kidneys and the stomach; and, what is more directly in point, betwixt the urethra and eye, in gonorrhœa. I am aware of a question that may be started here, namely, can a part distant from the lungs

sympathize with them, or be affected through their medium, without their being themselves sensibly affected? I would answer this question in the affirmative. I think it very rational to suppose, that a part already habituated to a particular disease, a disease too that gains ground by repetition, may become severely affected by sympathy with another part that has been but slightly or imperceptibly affected. In no other way can we explain the fact, that persons subject to rheumatism can, in the morning, before they get out of bed, or even in the night-time, prognosticate with certainty a change of weather. In such cases, the effects produced in the system, by the change that takes place in the atmosphere, must be through the lungs only, for no other part of the body is exposed to its action.

Knee has not been at all troublesome for some nights past. Took off his stockings last night with his own hands, a thing he has not been able to do for twelve months past. Is gaining flesh. The fore-arms, it is remarked by strangers, are more plump than formerly.

January 6th.—Had severe pain last night in both ankles, but especially in the right, and also in a slight degree in the elbow-joints; motion of these parts, however, no way impaired to-day. On inquiry, I found he sat an hour yesterday after my visit, with his clothes hung round him, for want of aid to put them on. Has some catarrhal symptoms, with slight cough. Here I may remark, that I have uniformly observed the return of pain, in this patient, to be accompanied with more or less of catarrhal symptoms,—an observation corroborative of what is advanced in yesterday's report, and indeed of our theory, and the whole reasoning on it, from beginning to end.

R Vin. ipecacuan. \bar{z} i.

Tinct. opii, gtt. xl.

Aq. font. \bar{z} vi. M.

the half to be taken an hour before, the other half at bed-time.

January 9th.—Has got cold anew. Coughed a good deal last night; severe pain in the ankles, wrists, elbows, and left-knee. Cannot walk to-day, nor suffer the bandages so tight as usual. Keen frost yesterday; thermometer at 40 to-day; weather boisterous and damp.

12th.—Is able to walk again, but has still some pain among

the tarsal bones of the right foot. I do not expect this patient to make any farther progress during the winter months, and shall be very glad if he retains what he has acquired. The bandages, it must be admitted, have done wonders; but they are not a match for an inveterate disease, weather variable in the extreme, an open house, with the patient's bed at the back of the door, a clay floor, and imprudent conduct, combined. I therefore close this case for the present, trusting I shall be able to give a more decisively favourable account of it hereafter.

From the preceding details it will perhaps be inferred, that it is in *chronic* rheumatism chiefly, that decisive effects are to be expected from *bandages*. This may lessen, in the estimation of some, the value of the remedy. But if it is attended to, that *chronic* is as often a cause as a consequence of *acute* rheumatism, that *chronic* rheumatism occurs out of all proportion more frequently than *acute*, *bandages*, as a remedy applicable with the fairest prospect of success in so many instances, cannot, if viewed impartially, be considered in any other light, than as the accomplishment of what has hitherto been a *desideratum* in the cure of rheumatism. To render this evident, we have only to reflect how often every mode of cure of that formidable disease proves abortive. It certainly must be ascribed, as well to the imperfection of the healing art, as to the obstinate nature of the disorder itself, that so many, in every rank, are subjected, during a great part of their lives, to the visitations of this horrible malady. *Bandages* bid fair to supply this deficiency. They are not like medicines exhibited internally, concerning whose operations and effects we are liable to form the most erroneous conclusions. Their effects are immediate and visible. We are not left at a loss to determine, whether the good produced is to be ascribed to the efforts of nature, or to the remedy employed; nor is it a matter of doubt, whether the remedy is of real advantage or not. There can be no uncertainty as to the powers of a remedy, which, the moment it is applied, enables a person to walk, who immediately, and for many weeks before, could not set the sole of his foot to the ground.

But were it even admitted that *bandages* are applicable, with effect, principally in *chronic*, it is evident that they may

operate, in many instances, as preventives, at least, of *acute* rheumatism. This is a fair inference from the girl's case above detailed. In her were present, though the symptoms did not run high, all the characteristics of *acute* rheumatism. But, by the timely application of *bandages*, not only were the pains immediately relieved, but the fever soon after subsided. A most useful practical hint this—showing that, as the derangement of the system was occasioned by local affection, so the melioration of local symptoms had its influence on those of the system. Here naturally arises the question, may not *bandages* supersede the necessity of repeated detractions of blood in *acute* rheumatism, even when local affections are not the primary symptoms? At any rate, *acute* rheumatism is soon subdued by the lancet; and, if *chronic* rheumatism supervenes, the application of *bandages* in this stage, will, we have reason to believe, prevent that lingering illness, general debility, rigidity and coldness of the limbs, pain and stiffness of the joints, so often the *sequelæ* of *acute* rheumatism.

Every practitioner, surely, of even very limited experience, must have met with cases of *acute* rheumatism, in which the difficulty was, not to subdue fever, but to set the patient on his legs; and, having set him on his legs, to make him walk. In this stage of such cases, more benefit, I hesitate not to pronounce, will be derived from *bandages*, than from all other topical applications that have ever been prescribed by the regular physician, or advertised by the empiric.

But a mechanical remedy that possesses, in any degree, the power of moderating or preventing *acute*, must operate in ten-fold effect in cutting short *chronic* rheumatism. Every body knows that, whoever have once become acquainted with rheumatism, may lay their account with a repetition of its visits; and the oftener it comes, and the longer it stays, it strikes its roots the deeper:—this to such a degree, as, in many instances, to render the patients miserable during its stay, and uncomfortable all the rest of their lives. The early application of *bandages*, by promoting, in the way formerly stated, circulation in the capillaries of the white parts, prevents their permanent obstruction, and consequently the disease from taking such hold of the system as to render it difficult afterwards to

be eradicated. That *bandages*, when early applied, must produce such effects, is proved by what they have done in Stewart's case; for, if they possess such powers in old inveterate instances of the disease, they must, *a fortiori*, be productive of like benefit in recent cases.

Summary of observations made on the effects of *bandages* in rheumatism.

At certain times, in some cases, but especially at the beginning, it is necessary to make the bandages tighter than they can be well borne for any length of time. In such cases, frequent removal of the bandages, and friction in the intervals, are indispensable.

The pains and rigidity of parts do not return immediately on the removal of the bandages; the effects remain for a considerable time after the cause is removed.

Parts that have for a considerable time been treated with bandages come at last to be covered, when the bandages are at any time removed, with a copious, warm, and fluid sweat, which gives a kindliness and pliancy to the skin, which it did not possess before.

Parts that have for a considerable time been treated with bandages acquire plumpness and strength, while parts of the same person, that do not admit of being bandaged, remain emaciated and tremulous as before. This observation is demonstrated in Stewart's case.

Observations on the Fœtal Liver, &c. &c. By JAMES BRYCE, F. R. S. E. Fellow of the Royal College of Surgeons, Edinburgh.

[From the Edinburgh Medical and Surgical Journal, for January, 1815.]

IT is a circumstance known to all anatomists and physiologists, that the size of the liver, compared with the other viscera, or with the body, is much greater before birth, than after that period; and, although the immediate cause of this be readily explained, by comparing the anatomical structure of this organ during the fœtal state, with its structure in the adult, yet, for what purpose it is intended by nature that this peculi-

arity should constantly take place in the fœtus, seeing less bile is secreted by the liver before than after birth, is a question which, as yet, has not been explained to the satisfaction of physiologists.

In the following pages I shall attempt to explain some important advantages which the constitution of the new-born infant obtains from the diminution which takes place in the size of the liver immediately after birth; and which, I presume, will appear to be of such consequence to the animal economy at that critical period, as to entitle me to deduce from them the final cause, or the purpose intended by nature to be effected, by the greater size of that organ during the fœtal state. For this purpose, we shall first attend to the general situation and connections of the liver, and from a comparative view of its anatomical structure in the fœtus with that in the adult, point out those circumstances on which its great size before birth seems immediately to depend.

The liver is the largest of all the abdominal viscera, and also the largest gland in the body. It is of a very irregular figure, being convex and smooth above, concave and uneven below. It is situated in the upper part of the abdomen, having its smooth and convex surface contiguous to the arch of the diaphragm, and its concave surface in contact with the stomach and part of the intestinal canal. In the adult, its size is such as, in a healthy state, to be easily contained in the right hypochondrium and epigastric regions; but, in the fœtus, it not only fills these completely, but also the left hypochondrium and greatest part of the umbilical region. It is divided into lobes, which, from their situation in the abdominal cavity, have acquired the names of right and left, by a deep furrow on the inferior surface, and by a corresponding membranous ligament above. In the fœtus, these lobes are nearly of an equal size; but, in the adult, the right is much greater than the left. Besides this division of the liver into two great lobes, there is, situated upon the right lobe towards its back part, and near the deep furrow already mentioned, a triangular eminence, called, by anatomists, the lobe of Spigelius; and near it another smaller eminence, which is anonymous; but to which and the other now mentioned the name of *portæ* has been applied, because

between these pass the blood-vessels of this organ before entering its substance.

The liver is connected to the surrounding parts by means of ligaments, which are formed chiefly by doublings of the peritonæum. The most conspicuous of these is that already mentioned as corresponding with the deep furrow. It is called by some, from its shape, falciform; by others, from the office it seems to perform, suspensory. By this ligament, which, in the fœtus, contains the umbilical vein in its duplicature at the lower edge, the liver is connected with the umbilicus, the anterior side of the abdomen, and with the diaphragm. By doublings of the peritonæum are formed the two lateral ligaments, connecting the lateral portions of the liver with the corresponding parts of the diaphragm. And another connection of this viscus, which has improperly obtained the name of ligament, is merely an adhesion of its substance to the tendinous part of the diaphragm.

The liver, even in the adult, is supplied with blood in a very ample manner in proportion to its bulk.

The great trunk of the aorta, having passed through the diaphragm, sends off a large vessel, called cæliac artery, which soon divides into three branches; one of which is distributed on the stomach, and another, passing to the left, goes to the spleen, while the third and largest goes to the right, and, giving off some branches to the adjacent parts, carries blood to the liver, and is then called the hepatic artery. This artery, passing between the portæ, enters the liver, and is, by innumerable ramifications, distributed throughout its whole substance, terminating in the beginnings of corresponding veins. The blood which this artery carries to the liver, as possessing all those qualities fitted for the nourishment of the animal body, is supposed to be destined solely for that purpose with respect to this organ.

Besides the blood thus carried to the liver by the hepatic artery, it also receives, in a manner peculiar to itself, a large quantity of blood by the vena portæ,—a vein apparently performing in the liver the office peculiar to an artery in other parts of the body. This vessel begins by innumerable small branches, and receives the blood from the whole of the other abdominal chylopoietic viscera. These branches unite, in their

passage towards the liver, into one great trunk, which, together with the artery already mentioned, is inclosed in a membranous capsule; and, running between the portæ, enters the liver, and, like the artery, is distributed throughout its whole substance. Of the ramifications of the vena portæ, some terminate in corresponding hepatic veins, whereby the blood is conducted into the vena cava inferior, and some in another system of vessels, called biliary ducts, through which the bile is carried from its secreting puncta into the gall-bladder and intestinal canal. The blood carried to the liver by the vena portæ is, from circumstances in the mode by which it is conducted thither, and circulated through it, and from its nature and general appearance, deemed that alone from which the bile is secreted by the peculiar action of this organ.

Besides these vessels, which are common to the fœtus and the adult, the liver receives before birth a very copious supply of blood by the umbilical vein. This vessel, conveying the blood from the placenta, passes into the body of the fœtus at the umbilicus, enters the substance of the liver at the top of the great transverse cleft or furrow which divides it into two lobes, and immediately detaches very considerable branches; by which it not only supplies the left lobe almost entirely, but affords also a very considerable supply to the right. Hence we find the umbilical canal, which is justly esteemed the termination of the umbilical vein, scarcely equal to one-fifth part of the size of that vessel before it enters the substance of the liver. Seeing, then, that the whole blood passing from the placenta to the fœtus passes through the umbilical vein, and that at least four-fifths of it must circulate through the ramifications of that vessel in the substance of the liver before it enters the inferior cava, we readily account for the greater size of that organ before birth, (viz. from the vast mass circulating through it,) than soon after that period. Hence, also, we see how the size of the fœtal liver, as depending on the increased quantity of blood which it receives by the umbilical vein during the fœtal state, must very quickly be diminished after birth, when the supply by that vessel is interrupted. And hence, also, we observe why the diminution, which takes place in the size of the liver after birth, is chiefly in the left lobe.

As another immediate cause of the greater size of the liver, during the fœtal state, may also be mentioned the presence of much mild and viscid bile in the biliary ducts, the ramifications of which extend throughout its whole substance. This is evident by anatomical inspection; and there is no doubt that, from this cause, the magnitude of the liver must be very considerably increased, compared to what it will be afterwards, when, from the action of the muscles of respiration, &c. this viscid matter comes to be completely evacuated into the intestinal canal. I would here observe, that there are many circumstances which render it probable that this mild and viscid bile, which is collected in the biliary ducts of the fœtal liver, by being propelled from thence into the intestinal canal immediately after birth, constitutes the meconium of new-born infants. It seems difficult to understand how the meconium, if secreted from the glands of the intestines during the fœtal state, or if propelled from the stomach during that period, should lodge in the bowels several months without inconvenience, and should, all at once, immediately after birth, acquire such a degree of acrimony as to induce those violent symptoms we daily observe to take place in newly-born children from the retention of this matter. The voiding of the meconium is evidently intimately connected with respiration; for an infant born in the seventh month will void this viscid matter in a few hours after that important function is established; and there is no instance in which infants born at the end of the ninth month have ever suffered this evacuation previous to their birth. As the evacuation of the meconium, then, is as common to the infant born at the beginning of the seventh month as to that born in the end of the ninth month, it is evident that this matter is equally prepared for evacuation in the seventh as in the ninth month, although, perhaps not in the same quantity; but how can we suppose this matter to be lodged in the intestinal canal with impunity, during two months before birth, seeing the retention of it for a single day after birth, whether that happens in the seventh or in the ninth month, is constantly attended with much inconvenience?

The explanation of the origin, and of the excretion from the newly-born infant, of that viscid and tenacious matter which

is called meconium, seems to be this: By the peculiar action of the liver during the fœtal state, much mild and viscid bile is secreted and accumulated in the biliary ducts throughout its whole substance. By the action of the diaphragm, and other muscles of respiration, immediately after birth the liver is considerably compressed, whereby the viscid bile, accumulated in the biliary ducts, is propelled from thence into the intestinal canal; where, acting as a powerful stimulus to the tender coats of the intestines, it excites them into action, and is consequently carried downward, and evacuated from the body; or if, from accidental circumstances, it be retained in the intestinal canal, it then induces those troublesome symptoms which are known to arise from acrid matters applied to the tender coats of the intestines. Does the pure arterial blood derived from the placenta, and which circulates through the fœtal liver, by imparting oxygen to the blood in the vena portæ, render the blood in it less fit for the secretion of bile? and also, does it render what is secreted from it less acrid? If so, ought not advantage to be taken of a knowledge of this circumstance to relieve, or effectually to remove, those violent symptoms which are induced by a superabundance of bile, or by a particular acrid state of it, by throwing in this principle of oxygen largely into the alimentary canal, whereby the blood, passing from thence to the liver in the vena portæ, may become highly impregnated with it? Is it on this principle that acids are esteemed correctors of acrid bile?

The final cause, or the purpose intended by nature to be effected by the great size of the liver in the fœtus, compared with what it is soon after birth, is a question which still remains unexplained to the satisfaction of physiologists. "Hucusque," says a late author, when treating of this subject, "nulla sufficiens assignatur ratio, ob quam vena umbilicalis ad hepar potius quam ad cavam immediate feratur, cur canalus venosus sit umbilicali angustior. Si vero insignem hepatis molem in fœtu spectemus, peculiari usui hoc viscus inservire, suspicio oritur, licet nondum sit nobis manifestus."* And in a similar manner do other physiologists express themselves on

* Vide Scassi de Fœtu, p. 93.

this subject, marking this peculiarity in the fœtus as a circumstance in the operations of nature highly deserving of attention.*

How far the following explanation of certain advantages which result to the newly-born infant from the diminution which takes place in the size of the liver immediately after birth, may appear satisfactory to account for its greater size during the fœtal state, I must leave to the able physiologist to determine. To me it appears that such a state of that organ, and effected precisely by the means we have mentioned, is so necessary in order to complete that grand revolution which takes place in the circulating system at birth, that any deviation from it, would, in my opinion, at that critical period, be attended with certain and immediate death.

In order to illustrate this, I would observe,

1st, That during the fœtal state the lungs are completely collapsed, are of a firm and compact texture, having very little if any† blood circulating through them in the pulmonary artery, and that there is no empty space in what is called the cavity of the breast.

2d, That in the fœtus the muscles of respiration are in a relaxed state, or in that state to which they will naturally return after every contraction, or at the end of every natural expiration.

This is strictly true with regard to the intercostal muscles; and with regard to the diaphragm, I would observe, that that muscle is not only not in a state of contraction, but that it is pressed upwards considerably beyond the state of natural relaxation; which occasioned the Baron de Haller to observe,

* Vide Monro's Lectures, MS.

† It appears to me extremely probable, that no blood circulates in the pulmonary artery and veins during the fœtal state, but that the whole of the blood passes directly from the right to the left side of the heart through the oval opening; that the right side of the heart and the arterial canal are not called into action until the period of birth, and that then the use of the arterial canal is only to convey a certain quantity of the blood from the pulmonary artery into the aorta, which could not be transmitted through that vessel until, by the full dilatation of the lungs, a free passage for the blood was obtained during all periods of respiration, after which this canal becomes shrivelled, and is gradually obliterated.

that "the cavity of the breast is short in the fœtus, and greatly depressed by the enormous size of the liver."

3d, That after the function of respiration is established in the newly born infant, a certain quantity of air remains in the lungs after every natural expiration.

This is proved by the simple experiment of immersing the lungs of an infant that has breathed, in water; although, before the infant breathed, the lungs were so compact as quickly to sink in that fluid, yet, after having breathed, the air can never again be so completely expelled from them by the ordinary efforts of respiration, as to render them again heavier than water, and they, therefore, now swim in that fluid. From experiments it is known, that a considerable quantity of air remains in the lungs of an adult after the most complete natural expiration, and that a quantity proportionally great is constantly in the lungs of the newly born infant, after the function of respiration and the great revolution in the circulating system have been fully established, there seems little room to doubt.

4th, This quantity of air remaining in the lungs after every complete natural expiration, and occasioning what I would term *the permanent dilatation of the lungs*, is absolutely necessary to admit of the free circulation of the blood through the pulmonary artery, during that period of respiration which takes place between expiration and inspiration.

This must appear evident, when we recollect that very little if any blood passes through the pulmonary artery in the fœtus, and also when we attend to that train of symptoms which clearly mark a disturbed, or entirely interrupted circulation in the pulmonary vessels, which takes place from diminishing this permanent dilatation, either by compressing the lungs themselves, as in hydrothorax, and in wounds of the breast, when air is admitted between the lungs and the pleura lining the ribs, or by diminishing the natural capacity of the chest, as happens by fits of coughing, or laughing, or from an increased size of the liver itself, as in many cases of hepatitis.

On an attentive consideration of these circumstances, the following question will naturally suggest itself: Whence proceeds, in the newly born infant, such a space in the chest, as to allow of that degree of permanent dilatation of the lungs,

which is necessary for the free circulation of the blood throughout the pulmonary vessels during all periods of respiration, more particularly during that period which takes place between expiration and inspiration? This question can only, I apprehend, be properly explained by carefully attending to the changes which take place in the liver immediately after birth.

From the situation and connections of the liver, formerly explained, we readily understand how any change in its magnitude will occasion a change in the capacity of the chest; and we know that a chief cause of the great size of this organ, in the fœtus, is the great quantity of blood which it receives by the umbilical vein; and it is evident, that when this supply is cut off, as happens at birth, the size of the liver must necessarily be much and quickly diminished. But this diminution in the size of the liver will necessarily remove that degree of pressure from the diaphragm, which occasioned it, in the fœtus, to protrude into, and greatly diminish the capacity of the chest. From this circumstance, the lungs will admit of a greater degree of expansion, from the air which is taken in by inspiration, and a certain degree of permanent dilatation of them, in proportion to the diminution of the liver, will be established, independent of the muscles of respiration. Thus, by the action of the muscles of respiration, by whatever means this may be excited, a quantity of air is taken into the lungs immediately after birth, which, if the circulation in the umbilical cord remains entire, will be completely expelled again at the end of every expiration; but as the force of the circulation in the cord, and consequently the size of the liver, quickly diminishes, the function of respiration becomes more strong; the capacity of the thorax, and the permanent dilatation of the lungs, increase; and as, in a short time, the circulation in the cord becomes entirely interrupted, the size of the liver, as depending on this circumstance, must be greatly diminished, the capacity of the chest increased, and the permanent dilatation of the lungs so far established, as to allow the blood to flow more or less freely through the pulmonary vessels at all periods of respiration; and, in proportion as the inspirations become more deep, and the muscles of the thorax and abdomen act more strongly, the size of the liver will be still farther diminished, by being more

fully emptied of the remaining blood which it had received by the umbilical vein, and also of that viscid bile which was collected in the biliary ducts in the fœtal state: thus still farther increasing the capacity of the chest, and establishing such a degree of permanent dilatation of the lungs, as freely to allow the passage of the whole mass of blood through the pulmonary vessels, even after the deepest natural expiration; at which time the arterial canal will become flaccid, and begin to be obliterated, and the revolution in the circulation of the blood may be reckoned complete.

The great advantages which the animal constitution obtains from this diminution which takes place in the size of the liver after birth, and consequent establishment of a considerable permanent dilatation of the lungs, are evident throughout life. By this means, the important function of respiration is rendered far less liable to be impeded, or entirely interrupted, by those accidents to which we are daily exposed. Thus, the smallest degree of diminution of the cavity of the thorax, or pressure on the lungs, as from coughing, laughing, from hydrothorax, empyema, &c. must, but from the circumstance mentioned, have been attended with very great inconvenience, or even immediate death; whereas, by the permanent dilatation of the lungs being established, we find, from experience, that a very considerable degree of diminution of the cavity of the chest may take place, or that the above diseases may be present to a considerable extent with little inconvenience.

The Baron de Haller, when treating of the peculiarities of the fœtus, more particularly of the great size of the liver, and of the diminution which it undergoes after birth, says—"Diminutio hepatis est ex naturæ finibus, locum enim pulmoni parat in quem se distendat, et obstaculum minuit quod diaphragmatis per inspirationem descensui se opponebat."

Here it is evident that there is a very great difference between the advantage supposed by the Baron de Haller to arise from the diminution of the fœtal liver after birth, and that which I have now explained; because, although we agree that the cavity of the chest is thereby increased, yet the opinion of that celebrated author was, that, by this diminution in the size of the liver, the lungs were merely allowed to be dilated more

freely at each inspiration than they could otherwise have been: but he certainly does not state, that, from this circumstance, such a degree of permanent dilatation of them is established as to allow the blood to flow freely through the pulmonary vessels during all the periods of respiration. Nay, it appears very clearly, that of this permanent dilatation of the lungs, and of the free circulation of the blood through them in the pulmonary vessels, during all the periods of respiration, he was entirely ignorant, as may be collected from the following passage, contained in his celebrated work: "*In inspiratione summa facilitas nascitur sanguini de corde dextro exeunti. In expiratione vero pulmo undique urgetur et in multo minorem molem comprimitur: vasa ergo sanguinea breviora quidem fiunt cum retractis bronchiis eademque angustiora nunc sunt, siquidem pectus secundum tres suas dimensiones arctatur. Sanguis ergo quidem in pulmones undique comprimitur; et venosus æqua vi pressus, partim versus arteriosum quidem reprimitur eumque moratur aliquantum, partim versus cor sinistrum promovetur. Quare in expiratione quam ponimus stabilem superesse, pulmonis pro sanguine immeabilitas oritur, quam neque absque palpitatione et vitioso conatu, demum omnino ullis suis viribus cor vincere queat.*" Lib. viii. sect. 4.

Besides the permanent dilatation of the lungs, there is also another advantage which the animal constitution derives from the diminution which takes place in the size of the liver immediately after birth, which is perhaps not less important. Since, during the fœtal state, very little if any blood circulates in the pulmonary artery and veins, and as, after birth, a very considerable quantity is constantly present there, it must be evident, that, unless some supply was added to the circulating mass, at the critical period when the revolution in the circulation takes place, such a quantity of blood must necessarily pass from the aortic into the pulmonic circle as to induce, in the former, such a loss of tension and tone as would be attended with the very worst consequences. In order, therefore, to prevent this, it is wisely ordained by nature that the liver should, in the fœtal state, receive, in the manner we have formerly pointed out, a much greater quantity of blood than is necessary for it to retain after birth. From this circumstance, when,

at birth, the circulation in the cord comes to be interrupted, the great quantity of blood which is at that time contained in the vessels of the liver is propelled into the vena cava, whereby such a supply of that fluid is given to the general circulating mass, as is necessary to prevent those bad consequences which would otherwise have arisen from the passage of so considerable a portion of blood from the aortic into the pulmonary circle: so that, in proportion as the liver is, by the action of the muscles of respiration, &c. gradually diminished in size, will not only the permanent dilatation of the lungs be increased, but also will the quantity of blood which is, after birth, constantly found in the pulmonary vessels of the lungs, be supplied by that which is propelled from the liver; and by this transmission, as it were, of a certain quantity of blood from the liver into the newly-dilated lungs, will that due balance be supported throughout the whole circulating system, which is so necessary for health, and that loss of tone and dangerous debility prevented which would, at such a critical period, have been attended with faintings, or the immediate death of the tender infant.

From these observations, I conclude,

1st, That the immediate cause of the great size of the liver, in the fœtal state, is chiefly owing to a greater quantity of blood circulating through it before birth than after birth.

2d, That the diminution which takes place in the size of the liver, after birth, is effected by the change which takes place in the circulation of the blood at that period.

3d, That from this diminution in the size of the liver, after birth, arises *that degree of permanent dilatation of the lungs* which is necessary to admit of a free circulation of the blood through the pulmonary vessels, during that period of respiration which takes place between expiration and inspiration.

4th, That, *by the transmission of a quantity of blood from the liver into the newly-dilated lungs, at the period of birth*, that loss of tone and debility is prevented which would often be attended with fatal consequences.

5th, That these circumstances are of such important advantage to the animal constitution as to ensure the constant for-

mation of the greater size of the liver before birth than after that period, and are consequently to be considered as the purposes intended by nature to be effected by that peculiarity in the fœtus.

Remarks on the Fever which occurred at Gibraltar in 1813. In a Letter from JOSEPH D. A. GILPIN, M. D. Inspector of Army Hospitals at Gibraltar, to COLIN CHISHOLM, M. D. F. R. S. &c. &c.

[From the Edinburgh Medical and Surgical Journal, for July, 1814.]

MY DEAR SIR,

I HAVE received your letter of the 11th November, and am happy, and not a little flattered that mine to you, on the subject of the contagious fever of 1793, has met your approbation. During the months of September, October, and November last, a disease in every respect similar to *that*, was prevalent in this garrison; and had we not thinned our population, by turning eight thousand persons out of it, it no doubt would have proved as destructive as it was here in 1804. I am the only medical man that escaped the contagion; and what was more extraordinary not a member of my family, six in number, caught it; and I know not another family of which that can be said. We all of us took four or five doses of bark every day, by way of keeping up the tone of the stomach. I do not pretend to say that we owed our safety to that, but I did the same at Martinico, and escaped infection there also. When the disease ceased, the lieutenant-governor called upon all the medical men to give in a statement of their opinions, as to the nature, cause, and treatment of it. I enclose you the slight sketch which I gave, together with a statement of the deaths, &c. and an authentic document sent me by a well-informed Spanish physician, who volunteered his services in the civil lazaretto, established without the walls of the garrison, and which clearly, in my opinion, proves that the fever was *imported*. In the statements of fifteen medical men, two only seemed to be undecided as to its being contagious; the rest were staunch

contagionists. In the street where it first appeared, the houses on *each side* were speedily affected. I had, with others, many numerous families under my care, the members of which were almost progressively attacked. I attended the governor, his lady, and three children, with servants, in all amounting to upwards of twenty; the servants indeed were sent, at least most of them, to the military lazaretto. I have had some correspondence with Sir James Fellows, the inspector at Cadiz. From his account, the disease there was highly contagious, and he mentions a curious circumstance,—that a body of people who were situated in a marshy situation entirely escaped the infection. I cannot at this moment lay my hand on his letter, or I would give you his own words. The disease at Malta is the true plague, with buboes, carbuncles, &c. By the last accounts from the governor, it is now confined to one village, which they have walled round, and have placed a cordon of troops. I should be glad to have Dr. Haygarth's work; I have no doubt of its being a valuable one. *Your* book, my dear sir, we have in the library, and it has been pretty well turned over lately, I assure you. I give you an extract of a letter to Earl Bathurst, I am certain it will give you pleasure, although it is so flattering to my feelings. The packet is about sailing, and I have returns, &c. to transmit to the Board. This must be my apology for this very hasty scrawl. Should you have any other commands, lay them freely upon me, being most sincerely and faithfully yours,

Gibraltar, March 1814.

JOS. D. A. GILPIN.

By publishing the extract from Governor Campbell's letter to Earl Bathurst, mentioned in the foregoing, I may perhaps commit a breach of confidence; but it is so honourable to the character of my friend, and does so much justice to his merit in the faithful discharge of his most arduous duty on this very trying occasion, that I cannot resist the desire to make the reader acquainted with it.

“Extract of a Letter from his Excellency Lieutenant-General Campbell, to the right honourable Earl Bathurst, dated Gibraltar, 25th December, 1813.

“In having the honour to make this communication, I feel it incumbent on me to notice particularly to your lordship, the great professional abilities, zeal, and attention, manifested by Dr. Gilpin, deputy-inspector of hospitals, as the head of the medical department. The able manner in which he has conducted the arduous duties of his situation, during one of the most trying periods that could have occurred, claims my warmest approbation; and for which I trust, together with his claims for long service in the West Indies, your lordship will have the goodness to submit the doctor’s pretensions to promotion, to the favourable consideration of his royal highness the Prince Regent.”

OFFICIAL STATEMENT.

“During the months of August and September last, I saw some cases of fever, which appeared to me to be the usual autumnal bilious remittent; but on visiting two men in City Mill-lane, I found them labouring under a fever, apparently of a still more serious type; but as I saw them only a few hours previous to their death, I had not sufficient grounds on which I could found a decided opinion as to the nature of the disease.

“I was soon after called by the late Mr. Pigoli, to see some of his patients; and in their cases I recognised the symptoms and appearances of a fever which has been denominated typhus icterodes, and of which I had seen numberless cases in the islands of Grenada, Martinique, and Guadaloupe, when physician to the forces to the late Lord Grey.

“In the month of October, I attended different families, the numerous members of which were attacked in succession, and with a fever of the same type. Many of the symptoms were similar to those which accompany bilious remittents, such as anxiety, listlessness, alternate chilly and hot fits, white tongue, yellow skin, nausea, vomiting, &c.; but those symptoms and appearances which I considered as characteristic of the dis-

ease above named, were the protruded red eye, and exquisite pain at the bottom of its orbit, and of the forehead, back, and limbs; and, as the disease advanced, the dilated pupil, excessive irritability of stomach, hæmorrhage from the mouth and nostrils, dark vomiting, skin of a dingy yellow hue, unlike the bright yellow suffusion of the bilious remittent, and in many cases a fatal total suppression of urine. To this catalogue I may add, that insidious cessation of symptoms, which almost always occurs about 60 hours from the first attack, raising hopes in the patient and his attendants, that are speedily quelled by an aggravated recurrence of every fatal symptom. This deceitful calm I have often witnessed in the general hospital at St. Pierre's, in Martinique.

“In the general mode of treatment, the medical officers of the garrison are, I believe, agreed. Calomel given at first, in rather a full dose, and afterwards in smaller ones, at the distance of three or four hours, seems to be the measure pursued; and it has been observed, that if the bowels be thoroughly opened, before the third or fourth day, the disease frequently proceeds with few untoward symptoms, and generally does so if the remedy affects the mouth. In the West Indies we hailed that effect as a very favourable one. In many cases, however, whatever might have been the previous treatment, a succession of alarming symptoms occur, and few more so than the extreme irritability of the stomach. Various remedies have been recommended, with a view to calm its violent action; the application of a blister; a table-spoonful, given at short intervals, of an equal mixture of lime-water and milk; solid opium in doses of half a grain or more, every two or three hours; pills made of Cayenne pepper, brandy, &c.; but it has been observed, that a repetition of purgative injections, and the patient's refraining for some hours (should his strength admit of it), from swallowing medicine or food, has had a good effect.

“The authorities for bleeding, in incipient cases of this fever, with a view to prevent congestion and subsequent topical inflammation, are no doubt very respectable; and, in some cases, when the patient was vigorous and plethoric, the practice has been successful. But we are now, I presume, possessed of a remedy in the cold affusion of water, which more

speedily produces a solution of fever, and checks the inordinate action of the heart and arteries, from the continuance of which arises the congestion and topical inflammation, so much to be dreaded. It is a mode, too, of removing fever, which possesses one great advantage over that of the lancet; for though it should not produce the complete effect intended, it certainly does not diminish the patient's strength, but leaves him in a state that may enable him to bear the operation of any other energetic remedy that may be thought necessary: on the other hand, should the loss of blood fail in its effects, we may easily conceive how ill the subject of it would be prepared to struggle against a disease so frequently rapid and fatal in its termination. I cannot say, however, that I saw many cases here, in which I would have recommended the cold affusion; neither the state of the pulse, nor the heat of the body were such, as, in my opinion, to warrant the application of it. I preferred, therefore, frequent *tepid* spongings with vinegar and water. Children, indeed, were much benefited by the cold affusion.

“That the disease in question is contagious, (or more properly speaking, *infectious*, as actual contact does not appear to be necessary to its transmission), I entertain not the least doubt, though an opposite opinion has been held by some highly respectable characters. I have witnessed, both abroad and in this garrison, too many melancholy instances of the disease being communicable from one person to another. At Martinique, in the year 1793, we suffered dreadfully from the ravages of a fever, in every respect similar to that which lately appeared here; and, in numberless instances, its infectious nature was ascertained, by its attacking those who were in attendance on the sick; and it is a melancholy truth, that very few of the medical officers survived the pestilential duty in which they were employed. But as, in this statement, I am only called upon to give my *own* opinion, I do not think it necessary to combat further the opinions of others. I shall merely add, that innumerable circumstances have brought a degree of conviction to my mind, that is not to be shaken by any arguments or reasonings on the side of non-contagion, that I have hitherto heard of or read.

“In endeavouring to account for the production of the dis-

ease in this garrison, many difficulties, no doubt, arise, which I do not by any means pretend to solve; but merely to state some of those which, in my opinion, militate against the idea of the disease having originated in Gibraltar.

“I find a difficulty, for instance, in viewing it as an endemic proceeding from marsh miasmata, or other noxious exhalations, as a considerable number of persons entirely escaped the disease, although strictly confined to the only situations where I conceive these effluvia may be supposed to exist, the dock-yard and navy garden. I find, too, a difficulty in attributing it to the peculiar state of the atmosphere, at the period of its appearance; for during the number of years that have elapsed since we have held this rock, surely the state of the atmosphere, and supposed prevalence of marsh miasmata, &c. must frequently have been as they were in the years 1804, 1810, and 1813; and I have not heard that a fever of a similar type to that which prevailed during those years is on record. Local circumstances may have varied, no doubt, and concurred in rendering the type of a reigning fever more malignant, such as a great increase of population, crowded dwellings, &c.; but, for some years past, I am informed, there has not been much variation on these heads. I am inclined, therefore, to believe, that this infectious fever was brought into the garrison by a person who died of it, soon after his arrival, it was said, from a place infected previous to his leaving it; and from affidavits on record, it appears that it was introduced in a similar way in 1804; and had it not been for the prompt and vigorous measures pursued, the year 1813 would have exhibited as melancholy a list of victims.

“JOS. D. A. GILPIN, D. I. H.

“*Gibraltar, December 1813.*”

Authentic official document (respecting the importation of infection), by a Spanish physician.

“The following is the mode in which, according to the nicest investigation, the fever was introduced into the garrison of Gibraltar, in this present year, 1813.

“On the 11th of August, a town xebeque, called the Fortune, whereof was master or patron one Lodovico Bosano, *alias*

Molta, arrived from Cadiz. One of the crew thereof being ill, was sent to the Catholic hospital, who died on the 19th of said month, with all the symptoms of the fever now prevalent, namely the yellow-fever.

“ A Frenchman, native of Paris, died on the 3d of September same year, in Governor’s street, near City-Mill-lane, with the same symptoms as the former man, and who had also come passenger on board the vessel before alluded to; and, from the 3d of September to the 11th of the same, nine persons died in the neighbourhood. On this day I observed, in the same district, two cases of the yellow-fever, which I instantly reported to Doctors Gilpin and Fraser, who consequently adopted the necessary precautions upon such alarming accidents.

“ It is also asserted, that a gun-boat which came in from Cadiz, about the beginning of August, had some of her crew put on board the prison ship, San Juan, who soon took the infection:—this fact will be better elucidated by the testimony of Surgeon Williams, of said prison-ship.

JOHN CORTES.”

“General Statement of New Cases and Deaths of the Epidemic Disease prevalent in Gibraltar, from the 8th September to the 4th December 1813.

New Cases.					Deaths.						
Date.	Laza- retto.	Town.	South.	Military Hosps.	Total.	Laza- retto.	Town.	South.	Military Hosps.	Total.	Detail of military deaths.
To Sept. 17	54	17	0	0	71	16	17	0	0	33	Officers, 25
24	110	0	0	211	321	26	20	5	28	79	Royal artillery, 65
Oct. 1	134	45	8	165	352	60	34	0	61	135	R. sap. and miners, 18
8	101	94	11	232	438	50	21	3	49	123	4th R. veterans, 47
15	104	198	27	261	590	48	20	2	69	139	7th R. veterans, 62
22	81	181	15	289	566	46	84	5	76	175	11th detachment, 17
29	34	63	3	158	258	26	34	0	57	117	26th regiment, 54
Nov. 5	9	14	0	95	118	3	3	0	25	31	37th do. 55
13	8	6	2	59	75	6	4	2	16	28	Foreign recruits, 21
20	5	5	3	27	40	2	3	0	9	14	Barrack department, 4
27	0	0	0	9	9	0	0	0	3	3	Soldiers wives, 43
Dec. 4	1	1	0	9	11	0	0	0	4	4	Children, 6
Total	641	624	69	1515	2849	283	204	17	397	901	Total 417

Jos. D. A. GILPIN, D. I. H.”

SELECTED REVIEWS.

Observations sur la Nature et le Traitement des Maladies du Foie. Par ANTOINE PORTAL, Professeur de Médecine au Collège Impérial de France, &c. &c. 8vo. pp. 646. Paris, 1813.

[From the London New Medical and Physical Journal, for February, 1815.]

THIS work on the Nature and Treatment of Liver Diseases is the production of M. Portal, a distinguished physician of Paris. His "*Anatomie Medicale*" and other valuable writings, are well known in this island. They reflect honour on his talents and industry; and entitle him to a conspicuous rank amid the more celebrated pathologists of the present age.

Of a book, containing more than six hundred closely printed pages, and treating upon a subject thus comprehensive and important, it will be difficult to institute, within the limits of common criticism, a clear or useful examination. With the principal divisions of the work, we shall notice any prominent or peculiar feature which it may display; present, in a concise form, and stripped of all superfluous ornament, the more instructive and luminous histories of disease, elucidated by dissection; and endeavour to convey to the British reader, a general and correct knowledge of the present state of French theory and practice in morbid affections of the liver.

Conformably to our design, we proceed to lay before the reader the plan, and enumerate the divisions of this important volume.

The work consists of two divisions. *Those diseases which are generally acknowledged to affect directly the liver*, compose the first.

Under the second division are considered *the conditions of the liver in various maladies, which are believed to have their origin in other organs; and which terminate, for the most part, in phthisis of the hepatic viscus* (phthisie hépatique). Eight chapters constitute the first division.

The first chapter treats *of pains of the liver.*

In illustration of this symptom, many cases are borrowed from the writings of respectable pathologists. Two only are cited from our author's practice. Dissection shows that pains of the liver commonly are produced by biliary concretions, ulcers, suppuration, or enlargement of that organ. It is satisfactorily proved, from several of these histories, that numerous, large, and even angular, concretions, may exist in the gall-bladder, unaccompanied by jaundice, pain, or other symptom, indicating their presence. Of this fact we have long been convinced. Our author's valuable cases we present with all possible brevity and precision.

A middle aged woman had long been subject to obscure pains in the epigastric region. Much food, mixed with bile and mucus, was evacuated from her stomach by the operation of an emetic; the pain became more severe and constant with frequent nausea. Portal was consulted; and discovered on examination, that the left lobe of the liver was affected. There was great soreness on the lightest pressure. Menstruation was obstructed. Medicine did not relieve. Vomittings, sometimes mixed with blood, succeeded. The epigastric pains were augmented. Fever came on. Food of every kind was rejected. Emaciation, diarrhœa, evening exacerbations of fever, and night-sweats, terminated in death.

Emollient drinks, bathing, and venesection had been employed.

The liver was found of a black colour and softened in structure; particularly the left lobe, which was large, and adhered closely to the peritoneum. The right lobe was externally of a violet colour; and the membrane readily separated from it, as in putrefaction. The pyloric orifice of the stomach was contracted; its circumference thickened. The vena portarum with its branches was full of thick black blood.

A lady experienced for many years pain in the hepatic region; and colic from indigestion. Her complexion was often yellow; urine red; stools gray. The lower limbs became œdematous: pain was felt in the situation of the right kidney. The urine grew turbid, and had at times the appearance of blood. The swelling of the extremities increased. Fluid collected in

the abdomen. Respiration became short. The pulse was commonly natural. Death was preceded by constant drowsiness.

The waters of Bichy,* regular bathing, leeches, and an alcoholic preparation of opium, were the remedies employed in this case; which had been by some of the physicians considered as an affection of the right kidney!

Two fortunate cases of liver disease, complicated with colic, jaundice, and pulmonic symptoms, are next detailed. They were treated by vomiting, bleeding from the arm and hæmorrhoidal vessels, blisters, soap-pills, with bitter extracts; infusion of soap-wort and hop; pills of assafætida and sulphur, infusions of borage and other plants with elder-rob; the terra foliata tartari (acetate of potass) dissolved in the juices of plants of the natural families of succory and borage; syrup of certain aperient roots; warm bathing; flannel dress; the mineral springs of Bichy.

In the fixed or wandering pains of the abdomen, and other parts of the body, consequent on continued or intermitting fevers, injudiciously treated by cinchona, our author recommends gentle vomiting and purging, diaphoretics, the waters of Bichy, the application of leeches to the hæmorrhoidal vessels. By others, as Baillon, general bleeding is preferred, even where symptoms of debility are manifest. We are warned to distinguish such pains from others, dependent upon a febrile state. In the latter, cinchona is indicated.

Our author, in his remarks on *hepatalgia*, contends that the substance of the liver itself is susceptible of pain, and successfully controverts the once received axiom: "ubi dolor, ibi morbi sedes." He shows that affections of the biliary system may be accompanied by pains in the umbilical, splenic, nephritic, or other more remote regions of the body. His explanation of the causes and symptoms of angina pectoris (the *stenocardia* of Brera) is neither satisfactory nor conclusive. He considers the pain of the superior extremities, occurring in that disease, as an affection of the diaphragmatic nerves, produced by the morbid liver; which, in these cases, he asserts, is enlarged, and

* "All the waters of Bichy," according to Dr. Saunders, "are warm, chalybeate and alkaline; probably mixed with some earthy muriats, which increase their operation on the bowels."

variously diseased. From an elevation of the diaphragm, and consequent diminution of the thoracic cavity, produced by this or other affection of the abdominal viscera, the heart, he contends, suffers constriction; and hence the peculiar phenomena of angina pectoris. Similar consequences may result from compression of the pericardium by intumescence of the lungs or mediastinum, or by dilatation of the heart or its large vessels, independently of hepatic malady.

That such morbid alterations of the thoracic or abdominal viscera must incommode the heart, and exert a pernicious influence upon its functions, it would be idle to deny. That these affections, existing at the same time, might signally favour the development, and aggravate the distressing symptoms of angina pectoris, we are ready to allow. But we do positively, and once for all assert, that the embarrassments resulting to the organ of circulation from such abdominal and thoracic enlargements, do not, whatever be their nature, duration, or degree, constitute the angina pectoris of British pathologists; a distinct and particular disease, having for its invariable cause, an ossification of the coronary arteries of the heart. Science is indebted for the discovery of the cause of angina pectoris to *British* labour and research.

A section on *the general treatment of pains of the liver* closes this chapter. Amid a crowd of various and often inert remedies, mercury is slightly mentioned, as useful in *hepatalgia* from a steatomatous and syphilitic taint. The English are reproached with the indiscriminate employment of this powerful mineral in inflammatory or other pains of the liver.

“But we have never,” says M. Portal, “seen them, (mercurial frictions) succeed in these cases. M. Vitet, who was a great advocate for such practice in pains of the liver, even when complicated with fever, and in various congestions of that organ, has repeatedly employed them under my observation without effect. On one occasion, frictions with the corrosive muriat (oxymuriat) of mercury were prejudicial.”

How are we to explain results so widely differing from those we daily witness in practice, on this side of the channel? Are we to hold them, as resulting from peculiarity of climate or constitution?

The second chapter treats of *enlargement, congestions, and obstructions of the liver; and of diminution, induration, and a softened state of that organ.* It comprehends four different articles. *Cases of enlargement of the liver, with remarks upon it,* constitute the first.

Twenty-three dissections of enlarged liver are here quoted from the works of various pathologists; many of them are highly interesting. In one case, recorded by Bartholine, the morbid organ is said to have weighed forty pounds. A remark made by our author in this place deserves to be commemorated.

“The liver appears to form a tumour in the abdomen in all those who have effusion in the right cavity of the thorax; and even in those, whose right lung has acquired an extraordinary volume; because the diaphragm is then thrust down towards the abdomen. This sometimes takes place in phthisical diseases, and may lead to erroneous conclusions.”

Our author, in his remarks upon this article asserts, that great eaters have a larger liver than sedentary, hard-working, or abstemious persons. The latter have often a contracted stomach, and very small liver. In rickety, scorbutic, scrofulous, and syphilitic affections; in those who have suffered from protracted fever, the liver is commonly augmented in bulk, often in weight. The increase of weight does not, however, invariably occur with increase of volume; an enlarged liver being sometimes lighter, or a diminished one heavier, than the organ in its natural state. He also exposes, in a rather humourous and sarcastic strain, the fallacy of an opinion entertained by some physicians, that the Spigellian lobe can be, when enlarged, felt by examination through the parietes of the abdomen. The effects which an enlarged liver may produce by mechanical pressure upon the surrounding organs, are next considered.

“But it is not,” says M. Portal, “only by the effects of compression which the liver exercises upon these organs, that their functions are disturbed. It may operate upon them, as upon the parts more remotely situated, by the medium of the nerves, the blood-vessels and lymphatics, or the cellular structure, which compose its substance; and of the membranes with which it is invested. And what influence, moreover, may not the liver exert, by means of its secreted fluid, upon the bowels, the lungs,

the brain and nerves; upon the urinary organs; the skin; and, in fact, upon all the solids and fluids of the body, as well in health as in disease?"

Disordered action of the heart, palpitations, syncope with constriction of the chest, pains and numbness of the superior extremities:

"Indeed," says our author, "all that assemblage of symptoms, erroneously described by the English as a distinct disease, by the name of angina pectoris, may result from the pressure of the diaphragm against the pericardium, by a liver enlarged generally or solely in its left or horizontal lobe."

Upon the error of this reasoning we have before delivered our opinions; it would be superfluous to repeat them.

The stomach may be thrust to the left when the right lobe of the liver is enlarged; downwards, by the pressure of the tumid left lobe. The spleen may, from a like cause, suffer compression, and be made to displace the left kidney. The inferior extremity of the œsophagus may be compressed and lengthened in the abdomen by the voluminous liver; especially at that part where the tube is lodged in an excavation of the latter organ posteriorly.* The cardiac orifice of the stomach may, in like manner, become contracted by the pressure of the hepatic tumour. The right kidney is often much depressed, from an elongation of the inferior extremity of the corresponding lobe of the liver.

The second article includes *general considerations on the symptoms, causes, prognosis, and treatment of the enlarged and obstructed liver, from anatomical and clinical observations.*

"Almost all chronic diseases, fevers, derangements of digestion, colics, as well as flatulence, jaundice, vomiting, diarrhœa, melœna, œdema, and the various species of dropsy, are accompanied by a general congestion of the abdominal viscera, and particularly of the liver."

The symptoms of hepatic obstruction are drawn with a very clear and masterly hand, in this chapter; from which obstruc-

* We are told, on the authority of Bartholine, that obstinate vomiting may arise from compression of the œsophagus, in its passage behind the tumefied liver. Hence, perhaps, sometimes the fatal vomiting which occasionally takes place in liver diseases.

tion, cutaneous diseases, in our author's opinion, frequently originate; and he finds that they yield to remedies capable of re-establishing the wonted course of the biliary secretion.

"The piles are a frequent consequence of disordered liver. They are sometimes so considerable as to occupy not only the margin of the anus, but to extend through the whole of the rectum, and even higher in the colon. We need only consider the circulation of the vena portarum, and the situation of this vein in the liver, to understand how frequently piles must be induced by obstructions in that organ."

"From the same cause, the cutaneous veins of the inferior extremities swell and become sometimes varicose; and this inference is supported by the salutary effect of aperient medicines in removing such dilatations, especially when they procure evacuations of bile."

We cannot, for ourselves, comprehend how the obstructed circulation of the vena portarum should operate in determining a varicose state of the superficial veins of the leg, although we have been long aware of its influence in producing hæmorrhoidal affections. Our author would probably have been more correct, in referring the former of these morbid phenomena to the compression which, under some circumstances, the inferior vena cava may suffer from the tumid liver.

Congestions of the liver may terminate variously; in inflammation and suppuration, chronic and occult, or acute; and manifested by hepatic pains, colic, jaundice, pyrexia with shiverings, colliquative sweats, diarrhœa, extreme emaciation: or gangrene, announced by cessation of pain and febrile excitement, prostration of strength, and syncope. Or they may, in other cases, take on the form of scirrhus induration; which, after existing a long time, falls commonly into painless, unhealthy suppuration; and thus the liver may be disorganized without any symptom clearly indicating this morbid and destructive process.

The gall-bladder, when distended with bile, may be felt by external examination: indeed, by light compression, bile may be made to flow from it into the intestines. When considerably enlarged, the posterior inferior extremity of the right lobe of the liver may be felt, particularly in an emaciated subject, through the numerous muscles by which it is covered.

The liver of the human subject, in an erect posture, descends lower than in the horizontal; protruding more than two fingers' breadth below the false ribs, in the former situation; where, in the latter, it is entirely concealed by them. Hence, our author takes occasion to expose the error of the common practice of laying the patient in a recumbent posture to examine the condition of the liver. He should stand up or be seated. The spine should be inclined anteriorly and towards the left. For obvious reasons, the liver will be most advantageously examined during inspiration.

As the liver may be pushed downwards by effusion in the thoracic cavities, or by enlargement of the viscera which they contain; so, on the contrary, it may be elevated to such a degree from its natural site, by curvature of the spine, abdominal dropsies, tumours of the spleen, mesentery, kidneys, ovaries, or uterus, that even considerable enlargements of that organ can no longer be detected by external examination. The situation of the liver may also be considerably changed by other deviations of the body, from its wonted form. "These notions," says our author, "are necessary to enable us to distinguish accurately, by the touch, if the liver be diseased or not."

In examining a subject in the horizontal position, we should take care that the bed on which he is laid, be not too yielding. The head should be raised, and supported by a firm pillow; the lower limbs bent, and the knees brought together: in fact, the abdominal muscles, and particularly the recti, should be put in the utmost possible state of relaxation; and in examining the condition of the various contained viscera, the hand will be most advantageously applied during the act of expiration.

A section on the general causes of obstructions of the liver follows. These causes are manifold, as catarrhal affections, syphilitic, scorbutic, scrofulous, &c. suppressed or excessive excretions, inflammations, compressions, various fevers, mental disturbances; but our author attempts not to explain their mode of operation. Obstructions of the liver, he adds, may be formed by blood, by bile, by lymph, or some one of the constituents of the latter, as albumen, gelatine, mucus. How far these distinctions and refinements are founded on correct observation; how far they may admit of discrimination in the living subject of

disease, and hence be turned to good account in practice, our readers will presently have an opportunity of deciding for themselves.

A fourth section contains some valuable remarks upon the *prognosis* in hepatic obstructions. At the fifth, on the *treatment* of these diseases, we shall not pause. With the exception of a few remedies, the practice recommended is very inert. Mercury, the sheet-anchor of British physicians, is barely mentioned. To this subject we shall, ere long, have occasion to revert.

Article third treats of *obstructions of the liver by various fluids*. Its first section is upon *sanguineous congestion* of that organ.

“There are few parts of the body,” observes our author, “so prone to sanguineous congestion as the liver; doubtless, not only because it receives a greater proportionate supply of blood by the hepatic artery and vena portarum, than other viscera; but because its veins are proportionally smaller than in other organs; and particularly so in relation to the capacity of the former vessels.”

Obstructions, existing in the pulmonary cavities of the heart; dilatations of those cavities; disorders of the respiratory organs, by opposing an impediment to the free circulation of the pulmonary artery, may occasionally determine congestion of the liver, as may thoracic effusions or morbid affections of the diaphragm. Obstructions of the spleen, by embarrassing the circulation of the splenic division of the common celiac trunk, and hence determining an unusual quantity of blood to the hepatic division; disease or augmentation of the volume of the stomach by immoderate eating, whence arises impeded circulation of the coronary artery of that organ, and of the gastric branches of the hepatic, may produce a similar effect upon the liver.* Thus gluttons have frequently been found to have enlarged liver, with spleen much diminished by the pressure of the cardiac extremity of the stomach. Upon the same obvious

* Our anatomical readers will recollect that the coronary stomachic artery, the splenic, and hepatic, are the primary divisions of one common trunk (the celiac.) Upon this foundation was raised, some years since, an ingenious but too mechanical and limited theory of the physiology of the spleen.

principle, tumours or dropsies of the abdomen, or compression of the abdominal parietes by tight clothing, may operate in producing congestions of the liver.

The phenomena peculiar to this morbid condition of the liver are pourtrayed by our author with great fidelity and precision. He considers the evacuation of pure blood by the mouth and rectum, so often occurring in these cases, as, in general, salutary; though sometimes followed by fatal exhaustion. It flows into the stomach or intestines from the cysto-hepatic duct. Abstraction of blood from the arm and hæmorrhoidal vessels, constitutes, with cream of tartar (supertartrite of potass) and certain vegetable preparations, of questionable efficacy, our author's principal remedies in this form of hepatic congestion.

Obstructions of the liver by bile and biliary calculi are considered in the second section of this article. We have here a long account of the physical and chemical properties of the bile, of its uses in the animal economy, and a survey of its influence in the production of diseases. Jaundice, our author asserts, may arise from absorption of bile from the intestinal canal, under certain circumstances of disease. He has even seen in the absorbents of the *mesentery* of patients thus affected, a "yellowish bitter fluid." The biliary ducts may become greatly enlarged, and the gall-bladder itself has been known to form an immense tumour, containing several pints of bile. After our author's remarks on the seat, symptoms, and physical properties of biliary calculi, and a sketch of the analysis of bile, by the latest French chemists, the following distribution of the former, by M. Fourcroy, is presented to us.

"There are six species of biliary calculi; the *hepato-biliary*, the *hepato-adipoceros*, the *cysto-biliary*, the *cysto-cortical*, the *cysto-adipoceros*, the *cystic* of a *mixed* character or *adipobiliary*; of these species, some are brown, blackish, irregular, tuberculous. Others are more hard, of a brown, yellow, or greenish colour, present concentric layers; the external one frequently dry, smooth and gray. The third variety comprehends white ovoid concretions, of a form more or less irregular, covered by a whitish, commonly unequal, crust, formed, as it were, of sparry layers or crystalline scales. All these calculi

are soluble in the pure alkalis, in solutions of soap, and in the fixed oils."

Upon the causes and treatment of biliary obstructions and calculi, nothing very novel or interesting is advanced. For their removal, repeated emetics, soap, bitters, chalybeate waters, and lime-water, borax (borate of soda) are recommended; and it is allowed, evidently with reluctance, that calomel, "*le remède de Durande*," may be very efficaciously employed in the commencement of the disease; although its salutary effects have been "unduly exaggerated."

Death may result from a rupture of the distended gall-bladder, and consequent effusion of its contents into the abdominal cavity. The tumour also, formed externally by a morbid collection of bile, may be readily mistaken for an abscess, and opened; an error which must often prove fatal. The remarks upon the means of distinguishing biliary from purulent collections, we shall briefly transcribe. They are judicious, and pregnant with practical utility; and although confessedly taken from a memoir of M. Petit, in the second volume of "*the Memoirs of the Academy of Surgery*," they may yet be unknown to the majority of our readers.

The tumour formed by the amplified gall-bladder is situated in the right hypochondrium, near the external border of the cartilages of the false ribs; has a sensible fluctuation, without pastiness; an uniformly smooth surface, without heat or redness. Jaundice, with colics, white alvine excrement, and universal itching of the body usually come on. There is pain shooting towards the umbilicus, and caused by dragging of the cysto-hepatic duct. In the progress of the disease, this pain becomes more diffused, and affects the centre of the epigastrium. Distension going on, the biliary tumour exhibits the characters of inflammation; and is, under these circumstances, with difficulty distinguishable from abscess. Sometimes this inflammation terminates in resolution, without the accumulated bile, which distends the gall-bladder, being discharged into the duodenum. In such case, the possibility of mistaking the collection for an abscess is obviously increased. An attentive observer, aided by the luminous diagnostics laid down here, might, however, be enabled to distinguish them with tolerable precision.

The bile, from long retention in its reservoir, may acquire acrimonious properties, or become of thicker consistence: in the first case, abscess, with fatal effusion into the peritoneal cavity, may ensue; in the other, biliary concretions may be formed, attended by all their train of violent and distressing symptoms. When, in consequence of inflammation, adhesion has taken place between the distended gall-bladder and the peritoneum, the contents of the former may, in some cases, be successfully evacuated by the knife, as they cannot then be effused into the abdominal cavity. Surgeons have even gone so far as to perform this operation; extract biliary calculi; and, by the introduction of a probe through the wound, attempt to remove the obstruction of the cystic duct; but it is a perilous enterprize, and as such has been absolutely rejected by the celebrated Sabatier.

The most common causes of biliary obstructions are, according to our author, calculi lodged in the gall-bladder, the cystic, hepatic, or common ducts; or, "plastry concretions" compressing the parietes of those ducts; scirrhus of the duodenum; and morbid enlargement of the pancreas. Pancreatic calculi, by obstructing the orifice, common to the biliary and pancreatic ducts, may, we suspect, sometimes, though perhaps rarely, operate in producing the same effect.

The whole of this section, a few apparently obscure passages excepted, is written in a very clear manner, and contains much valuable information. We particularly recommend an attentive perusal of it to the reader.

The third article of the second chapter of M. Portal's work is upon *obstructions of the liver by various fluids*. Its first and second sections, on *sanguineous congestions of the liver*, and on its *obstructions by bile and biliary calculi*, have already passed under review.

Lymphatic obstructions of the liver constitute the subject of the third section. Under this generic title are comprehended three different species of obstruction: *the albuminous, the gelatinous, the mucous*. We shall attempt to elucidate our author's opinions upon these differences, and to expose the base on which they are founded, by a statement of the morbid appearances peculiar to each species, which examination of the liver after death presented.

Albuminous obstructions.—Morbid appearances: The maxillary glands; those of the absorbent system, situate beneath the platysma myoides and between the trachea and jugular veins; the glands of the lungs and mesentery, enlarged and filled with a plastry substance; the lungs themselves much shrunk and hardened. The liver enormously large; its anterior margin greatly indurated; the substance, when stripped of its membrane, whitish; more so internally than on the surface: layers of a dark gray colour disposed here and there. Many lymphatic vessels, gorged with a thick substance, appearing like hard slender cylinders, both in the interior and on the surface of the organ. The substance distending the liver equally white. Symptoms: Extreme emaciation; disgust for food; maxillary glands and absorbents of the neck enlarged; abdomen indurated; liver evidently projecting in the epigastric and right hypochondriac regions; and hectic fever. The subject, a boy of eight years.

The matter forming these obstructions, our author was led to consider as extravasated albumen. He supports this conclusion by some rather coarse experiments. A slight acquaintance with modern chemistry would surely have suggested tests more delicate and unequivocal. Different portions of the morbid liver were found to harden on exposure to a brisk fire, and on immersion in boiling water or alcohol. These results are confirmed by the examination of a second analogous case.

“The albumen,” it is subsequently observed, “which forms these lymphatic obstructions, is hardened by the action of fire or alcohol. The gelatine, on the other hand, liquifies by heat, and remains permanently in solution, when dissolved in boiling water; while mucus, thus treated, rises to the surface, and differs from fat, which in the former respect it resembles, in not being inflammable.”

Our author, in his treatment of lymphatic congestions of the liver, prescribes preparations of ammonia; mercurials with antiscorbutics and bitters. Pills, composed of muriat of ammonia and oxymuriat of quicksilver, are a favourite remedy. Mercurial frictions are likewise recommended, and the mineral waters of Barèges, of Cauterêts, and Aix-la-Chapelle, especially after the administration of mercurials.

Gelatinous obstructions.—Morbid appearances: Liver weighing twelve pounds, and of a rounded figure. The fissure, separating its two great lobes, well-nigh obliterated. Several variously-sized eminences on its external surface. Internal structure of uniform consistence, rather relaxed than condensed; colour irregularly gray and red. The parenchyma, in some parts, unchanged; in others, appearing confounded with a foreign substance, which formed tumours on the external surface of the liver, and filled some unnatural cavities in the interior of the viscus. Symptoms: Gradual emaciation without evident cause; light yellowness of the skin; hiccough; severe colic; high-coloured urine; whitish fæces; depraved taste; pains, with remarkable protuberance in the epigastrium; excessive vomiting and marasmus; evening accession of fever; the abdominal tumour becoming, before death, very hard and unequal, and occupying all the right side to the corresponding ileum and navel. The subject, a boy of four years.

The substance occupying this liver became liquid, on exposure to gentle heat; did not take fire or crepitate on burning coals; did not coagulate in alcohol or boiling water, and remained permanently dissolved in the latter: the undoubted characteristics, in our author's opinion, of gelatine. Other cases and dissections of the same nature are recorded.

Mucous obstructions.—No history is given in elucidation of this species. The substance forming them dissolves in warm water; but rises to the surface on the reduction of the temperature, and becomes a dry pellicle upon exposure to air: it does not inflame on burning coals. This will be found generally, though not always, the predominant principle in very indurated livers.

Liver gorged with serum and containing hydatids.—Of this form of disease five histories are detailed. The shortest and most interesting we transcribe. Morbid appearances: A large cavity in the great lobe of the liver, filled with hydatids; the colon ulcerated, and adherent to the liver around the morbid excavation, and communicating with it by a common aperture. Symptoms: Constant pain in the region of the liver; griping in various parts of the abdomen; bodies, resembling vesicles, voided by stool; disease lingering. Subject, a man, aged 40.

In the third and fourth sections on *obstructions of the liver*

by fat, and on *compound obstructions*, nothing occurs to arrest our attention. The characteristic properties of the obstructing matter in the former, are its rising to the surface after solution in hot water, and its inflammability. We must be careful not to mistake a white and fatty appearance of the liver for its total conversion into adipose substance. The latter are formed by a combination of two or more of those simple species of obstruction which we have been considering.

The sixth section contains remarks on *various morbid conditions of the liver, indurated, diminished, softened*.—Eleven illustrative cases are quoted from divers sources. But these remarks are, like the concluding article of the chapter on *hepatocoele or hernia of the liver*, destitute of peculiar attraction.

How, we would ask M. Portal, are the varied forms of hepatic obstruction, which he has with such labour and minuteness been exposing, to be detected in the *living* subject of disease? Is each variety of organic lesion characterized by a peculiar set of external phenomena, which can enable us to decide with correctness upon its precise nature, and influence our therapeutic views? We apprehend not: or surely M. Portal could scarcely have so far forgotten the great end and aim of all pathologic research, as to neglect the opportunity thus afforded of throwing new light upon the dark and perplexing paths of diagnosis. After reiterated examination of the sections, in which the several species of hepatic congestion are described, no pathognomonic symptom, no peculiarity of external feature, calculated to serve as a base of practical distinction, has arisen upon our view; and it moreover appears, that in the several varieties of lymphatic obstruction, even dissection itself, unaided by a ray from the torch of experimental chemistry, is inadequate to illustrate the precise differences of morbid structure. Subtle distinctions too frequently serve rather to clog, than accelerate the march of science: yet, on the other hand, it is unwise to condemn rashly, new facts or discoveries, because we see not, or are incapable of directly appreciating their applicability to the improvement of that branch of science in which they have arisen.

Faundice constitutes the subject of the third chapter. Twen-

ty-two dissections are brought together in elucidation of its various causes. As this disease, or rather symptom, is referable to morbid affections of the internal organs, so different in seat and character, we deem it better to arrange and generalize the results of these dissections, than to enter minutely upon any individual history.

Morbid affections, giving rise to jaundice, may reside immediately in the liver or its appendages; or in some neighbouring or remote organ. In the latter case, the biliary secretion may be obstructed in its course to the duodenum by the direct and evident mean of mechanical pressure; or is disturbed in a manner inexplicable upon obvious principles, and probably referable to the trackless and mysterious influence of sympathetic irritation.

Of these twenty-two cases, fifteen came under the first class; and in all of these, dissection showed, as the origin of the morbid phenomenon, biliary concretions: an enlarged, indurated, scirrhus, tuberculous, purulent or sphacelated state of the liver:—or one or other of these forms of organic lesion, complicated with concretions. The other seven cases belong to the second class; and here, indurated pancreas, scirrhus duodenum, tumours of the mesentery, enlarged spleen, or dilated colon, were detected. Amid several histories, subsequently quoted, to prove that jaundice is not the invariable consequence of biliary concretions, however large or numerous, we shall transcribe one, conspicuous for its singularity; and subjoin our author's explanation of the phenomenon, as it appears to us alike rational and correct.

“Upon inspecting the abdomen of an irritable old man, no gall-bladder could be discovered. A large biliary calculus occupied its place.”

“I cannot believe,” observes M. Portal, “that the subject of this case was without a gall-bladder, as Fernal (from whose writings it is quoted) represents. More probably, the concretion being so large as to completely fill the reservoir, the parietes of the latter acquired an intimate adhesion to it; and hence appeared to be wanting. Thus the heart has been said to be destitute of pericardium, when this membranous sac has

become closely and universally adherent to the external surface of the contained organ."

After some observations on the *name* and *symptoms* of jaundice, *its most clearly-ascertained causes* are enumerated in the following order: 1st. Bilious plethora. 2dly. Sanguine plethora. 3dly. Inflammation of the liver and neighbouring organs. 4thly. Diminution or suppression of natural or morbid evacuations. 5thly. Severe or protracted pain. 6thly. Acrid poisons or the bite of venomous animals. 7thly. Violent affections of the mind. 8thly. Fevers. 9thly. Congestions or obstructions of the abdominal viscera, particularly the liver. 10thly. Falls, contusions, severe compressions of the abdomen; and the catalogue of exciting causes is closed, with an obvious and inexplicable want of correctness, by *infantile jaundice*.

Upon each of these subjects our author enters separately. Amid the various causes determining sanguineous congestion of the liver, pregnancy is mentioned, as causing the blood to be retained in the vena portarum. But how the obstructed circulation of a vessel should operate in producing a state of sanguineous congestion in any organ which derives from such vessel its principal supply of blood, we profess ourselves utterly unable to comprehend.

Suppression of accustomed evacuations, or the injudicious repulsion of cutaneous diseases, is frequently succeeded by jaundice. M. Portal knew a lady, who having, by the application of powdered alum, removed a very copious and offensive discharge from the axillæ, was immediately seized with jaundice; from which she did not recover until the salutary excretion had been restored. In referring the jaundice, which frequently arises during an attack of gout or rheumatism, to the pain attendant upon these diseases, an error is surely committed; of which we could scarcely have suspected an intelligent observer like M. Portal. It will, we believe, be found, upon rigid examination, that disturbance of the biliary system forms a common, if not essential, feature in the origin of all gouty and rheumatic affections. We, perhaps, go too far, in hazarding an opinion, that the day may not be far distant, when these insatiate foes of human comfort, their dependence upon certain forms of abdominal derangement clearly and invaria-

bly detected, shall no longer occupy a place in the list of idiopathic diseases.

Biliary concretions have frequently been discovered in the gall-bladder and cystic duct of persons, who, when living, had exhibited no appearance of jaundice. The explanation of this circumstance is without difficulty; while the hepatic and common ducts are free, bile will be regularly excreted into the duodenum: and even, when either of the latter is obstructed, provided the obstructing mass be not so situated as accurately to plug the canal, a sufficient quantity of the biliary fluid may find a passage to the intestine; and thus the decisive manifestation of jaundice be obviated. Hence, an opportunity presents itself of remarking, that jaundice and absence of bile in the alvine discharges, although common, do by no means form essential symptoms of the existence of gall-stones, or of their passage through the biliary ducts to the duodenum.* But, whenever the cysto-hepatic ducts be accurately closed by a concretion, both of these symptoms will be found to prevail, in a degree more or less conspicuously marked.

In speaking of infantile jaundice, our author expresses his belief, that the affection is attributable to the change produced in the circulation of the hepatic vessels at birth, by the closure of the umbilical vein. It may also, in his opinion, arise from influx of bile into the absorbents of the intestinal canal. He considers the meconium to consist entirely of bile which has acquired a dark colour by long residence in the gall-bladder; from whence it is expelled at the child's birth, by the pressure of the diaphragm and abdominal muscles upon the biliary organs, in the first convulsive efforts of respiration.

The valuable results of our author's experience in the *prognosis* of this affection, we shall endeavour to present in a summary and concise form: Jaundice assumes a menacing or incurable aspect, when arising from organic lesions, scirrhus, or abscess of the liver; when a softening of the right hypochon-

* This observation is well illustrated by "a fatal case of vomiting," recorded at page 89 of the eighth volume of this Journal, where, although the *hepatic duct* was found obstructed by several biliary concretions, no feature of jaundice had manifested itself during the patient's illness; and the feces invariably announced a regular excretion of bile into the duodenum.

drium succeeds a state of induration and enlargement; when manifesting itself in the onset of fevers; when consequent on hiccough or complicated with hectic fever. In the latter case, some suppuration of the biliary organs is commonly indicated.

The issue may, in general, be considered favourable, when jaundice does not originate from organic lesion of the chylo-poietic viscera; when it is uncomplicated with hardness and enlargement of the hypochondria, or pain, tension, or tumour in the other regions of the abdomen; when determined by bilious or sanguine congestion of the liver, violent vomiting or indigestion; when attacking young girls at the age of puberty, pregnant, or hysterical women; when caused by the suppression of various established evacuations; when appearing in the decline of fevers, especially if no symptom of abdominal mischief exists; and there be, at the same time, copious discharges of bile from the bowels.

Jaundice, for the most part, yields more readily, when of the yellow than of the black species; when the consequence of sudden and violent, than of long-existing mental disturbance; when occurring in tertian, than in quartan intermittent fevers.

Favourable appearances in jaundice.—The stools, before gray, resuming a proper bilious aspect; the restoration of the urine to its natural colour, the return of the hemorrhoidal or menstrual flux in persons who have experienced a suppression of them; diminution of bitterness of the mouth; universal itching of the skin; cessation of flatulence and colic.

Diarrhœa and dysentery, occurring in jaundice, are unpropitious; and the hemorrhagies, which take place in the disease, are often incurable. Obstinate jaundice generally terminates in dropsy.

We shall not swell out our critique by an enumeration of the medicinal remedies employed by our author, in the treatment of jaundice. A more correct notion of French practice in these affections will, perhaps, be conveyed to our readers, by briefly transcribing a consultation preserved, and in this place presented by M. Portal.

The subject of this case was a man, of fifty years; of strong constitution, but thin. He had been six months jaundiced; he experienced great itching of the skin; his stools were ash-co-

loured; urine thick and of a red brown hue. The liver was much enlarged and indurated; occupying the right hypochondriac, the epigastric, and part of the left hypochondriac regions. To resolve this obstruction by re-establishing the course of the bile, was deemed the principal indication.

Pills, formed of soap, gum ammoniacum, and inspissated gall of the ox, were directed to be taken night and morning, with a decoction of the roots of dock, polypody of the oak, and celandine, in lean veal broth. To the morning dose of this decoction was added a quantity of *sal e duobus* (sulphat of potass).

The bowels not relaxed after a continuance of this plan for twelve days, and an addition of the neutral salt failing to produce this effect, the patient must take every night, or night and morning, pills composed of rhubarb, jalap, aloes, diagrydium, (a preparation of scammony,) and syrup of buckthorn. These must be continued until the bowels are loose, and their evacuations resume a natural colour.

This object attained, the former remedies are to be discontinued for two or three days; and a purgative potion to be substituted; consisting of a solution of manna and vegetable alkali, in an infusion of senna leaves, coriander-seeds, chervil, and succory, with a sliced lemon.

A mixture of mercurial and hemlock plasters, with *diabotanium*,* to be applied to the whole extent of the abdominal tumour; and renewed every five or six days. The diet of the patient was directed to consist of good animal broth, with bread and vegetables; fresh eggs, preserved apples, &c.: his only drink to be water, in which a few grains of purified nitre have been dissolved.

The jaundice, we are told, was nearly removed by a six weeks' perseverance in this plan: the abdominal tumour had

* The *diabotanium* plaster presents a precious specimen of the pharmaceutical science, simplicity, and vigour of the old French schools. We enumerate in the formula not less than fifty-four ingredients from the animal, vegetable, and mineral kingdoms. Amid these, *oil of worms*, *oil of puppies*, *oil of bricks*, and *pidgeons' dung*, hold a distinguished rank.—A writer, in the *Dictionnaire des Sciences Medicales*, justly stigmatizes it as a monstrous composition.

nearly disappeared. The soap-pills were continued, and the patient directed to swallow every morning, a dose of acetate of potass dissolved in four ounces of clarified juice of succory, borage, and other antiscorbutic plants; and afterwards to repair to the waters of Vichy. "This treatment," observes M. Portal, "was crowned with astonishing success:" at the same time, he has the modesty and candour to acknowledge that it was somewhat too complicated. We surely agree with him.

"In fine," says M. Portal, at the close of this chapter, "it is necessary to inquire, in every species of jaundice, whether there exists not in the liver, the spleen, or the mesentery, some congestion; or some obstruction in the other organs; which may, by its influence upon the hepatic system, disturb those functions essential to the formation and excretion of bile; for, until these obstacles be destroyed, every effort for the removal of the jaundice must necessarily fail."

The result of this writer's experience, as to the regimen of patients in jaundice, is thus summed up:

"It (the dietetic plan) should be strictly observed. A mixture of good animal food, boiled vegetables, and ripe fruit has commonly succeeded in my practice; and for drink I recommend good Burgundy wine, with light infusion of germander (*teucrium chamædrys*) hop or common horehound; or coffee. I forbid ragouts, and especially milk diet, butter, and cheese. The plan of supporting patients on animal food alone, and allowing them wine and spiritous liquors without restriction, I have not found to succeed."

Exercise on horseback is very useful in the treatment of jaundice. Of electricity, as a solvent for biliary concretions, M. Portal thinks unfavourably.

Hepatic colic is treated of in the fourth chapter. Eight histories of the disease are detailed at length; and two others briefly noticed. They possess, in general, an aspect highly interesting to the pathologist. The first six cases exhibited, on dissection, biliary concretions filling the gall-bladder or obstructing the various ducts; abscess of the liver, or both morbid conditions complicated. In the fourth case, there was "an abscess between the abdominal muscles; which communicated, by a sort of ligamentous canal, with the gall-bladder;" and

had allowed, during the patient's life, the escape of mingled pus and bile from a fistulous orifice, externally situated.

The seventh case, from our author's practice, we shall concisely exhibit. Its history and dissection are alike instructive: and the narrative will depict in stronger colours than any language of our's, the inexplicable torpor of French practice, in the most conspicuously marked and menacing forms of liver-disease.

Morbid appearances:—Liver enlarged; in some parts, almost scirrhus; in others, much softened and of a violet colour; its posterior surface blackened; a portion near the gall-bladder in a state of putrefaction: traces of suppuration, and biliary calculi, in its internal structure. Black pitchy bile, with many small concretions, in the gall-bladder. The stomach of a large size; the circumference of the pylorus tumefied; its orifice contracted: the gastric blood-vessels distended with black blood. The spleen very large and full of black blood. The right kidney increased in bulk, and of a red colour.

Symptoms: Nausea; disgust for food, light colics, which the physicians knew not whether to refer to an affection of the liver, or urinary organs; yellowness of the skin favoured the first opinion; pain in the right lumbar region, and slight dysuria, the last. Gravel; rheumatic gout; pains in the right hypochondrium; indigestion; increase of nausea; emaciation; yellowness of the countenance more decided; bitterness of the mouth; bowels very irregular; the stools consisting, at times, of pure bile. Abdominal pains more fixed; often shooting from the region of the gall-bladder to the navel; frequent tension of the epigastrium; continual vomitings; fever; urine of deep red colour, and diminished in quantity; stools suppressed; pains in the right knee and corresponding great toe. Pulse full; region of the liver tense and shining.

In this state the patient was first visited by M. Portal. The hemorrhoidal disposition suggested the application of leeches to the anus. This remedy was twice employed; blood was also drawn from the arm. The symptoms were aggravated. Some anodyne medicines only, we should remark, had been previously prescribed. After venesection, clarified whey, chicken-broth with infusion of lime-tree; ptisan of dog-grass and of

wall-pellitory with nitre; emollient injections and fomentations; baths, with an anodyne at night, were successively, or otherwise recommended. This treatment was, at first, beneficial; but the storm gathered afresh. The nausea and vomiting increased; the pulse became frequent, contracted, irregular; evacuation by stool and urine was suppressed; the eyes and whole surface of the skin of a deep yellow; hiccough, augmenting in frequency and force, came on; blisters, applied to the legs with the view of producing "a revulsion of the gouty or rheumatic humour," were ineffectual. Aperient and lightly sedative potions with preparations of lime-tree, *gallium luteum*, black cherries, and nitric ether; Sydenham's anodyne drops were prescribed in vain. Oil of turpentine, mixed with sulphuric ether, aggravated the symptoms. Syncope, cold sweat, and delirium succeeded; and death speedily ensued. The unhappy subject of this history was a man of strong constitution; of a florid but, at times, coppery complexion; a great eater; subject to the hemorrhoidal flux. He suffered much fatigue and uneasiness, from his parliamentary situation, during the early gusts of the French revolutionary storm.

An enlightened practitioner of Britain would, we believe, have felt little hesitation in referring the affection of the right kidney, and all the train of morbid phenomena exhibited in this case, to a diseased condition of the liver. The features of hepatic disease have rarely been surveyed in a more clear or unquestionable light. It has never been our lot to observe "gouty rheumatic pains" unconnected with evident marks of disturbance in the right hypochondrium. Do they not affect, almost exclusively, bilious and hemorrhoidal subjects? Are they not frequently complicated with gall-stones and jaundice? Such, at least, are the results of our experience. How differently this ill fated *parlementaire* might have fared in the hands of a British physician, it would, perhaps, argue an illiberal spirit to surmise: but we will venture to assert that, manfully opposed by leeches, the lancet, the slipper-bath, mercury, opium, saline purgatives, and the carbonated alkalis, the "grim tyrant" would have had a harder and more protracted conflict to sustain.

The eighth case, as peculiarly interesting, and most satis-

factorily elucidated by dissection, we shall also quote. It is taken from the *Historia Anatomico-Medica* of Lieutaud.

Morbid appearances: The liver enlarged, and of a yellow colour; the gall-bladder greatly distended with bile; *a large lumbricus lodged in the cysto-hepatic duct*. Many worms in the stomach and intestines.

Symptoms: Acute fever with tormina; abundant flow of saliva; tumescence of the abdomen, and especially of the right hypochondrium; yellowness of the face and eyes; cardialgia; unequal pulse; white fæces; convulsions: the subject, a boy of fourteen years. Lieutaud cites from Wierius another history of obliteration, or rather obstruction, of the common biliary duct by intestinal worms.

Three fortunately terminating cases of hepatic colic are detailed with great minuteness. The treatment employed in them we shall here not pause to describe. Our time will, perhaps, be more usefully occupied in defining the affection thus designated by our author; and in collecting from his scattered hints, rules of diagnosis proper to aid us in discriminating between hepatic colic and other morbid affections with which it may be confounded.

M. Portal defines hepatic colic to be pain, more or less severe and lancinating, various in duration, and frequently recurring; which occupies chiefly the right hypochondrium, extending from thence to the stomach, the colon, and umbilicus: it has its precise seat in the gall-bladder or biliary ducts.

Hepatic colic arises from obstruction of the biliary ducts, by superabundant or thickened bile, by biliary concretions, or worms; from any cause capable of constricting or exerting compression upon the cysto-hepatic duct, as inflammation, enlargement, or other morbid affection of the stomach, duodenum, or various abdominal organs. It may be produced also by worms, or other matter, irritating the intestinal canal. The proximate cause of the pain is the violent contraction of the diaphragm and abdominal muscles; which may be regarded as an effort of nature to expel from the liver or its ducts, the irritating matter.

The hepatic colic may be distinguished from *hepatalgia*, of which it is a species, by the intervals of ease which the patient

experiences; by the cessation of pain immediately, or very soon after the bowels have been evacuated, especially if the discharge be bilious; by the shooting of the pain from the liver to the navel; and by pressure upon the hypochondrium, which, in the former affection, does not aggravate the pain. It differs from *hepatitis* in the absence of pyrexia; from the *bilious colic* in the situation of the pain, which occupies principally the stomach, small intestines, and colon, in the latter; though sometimes the liver is conjointly affected. A continued fever, of several days' duration, frequently accompanies the bilious colic; and this affection is not, like the hepatic, subject to relapses. The two forms of hepatic and bilious colic sometimes co-exist, although more commonly the latter is consequent on the former.

We must not confound the *nephritic colic* with the hepatic. In the latter, there is no retraction of the testicles towards the abdomen, and the urine is red and thick; while, in the former, it is suppressed or clear, except in the decline of the affection, and sometimes bloody. The symptoms of the kidney affection are not mitigated by alvine evacuation: there is generally fever in proportion to the pain; that pain is increased by the lightest pressure. The hepatic colic sometimes, although much more rarely than the nephritic and other colics, terminates in inflammation.

Sometimes, a marked degree of resemblance exists between the hepatic and the *painters' colic*. The former, however, is characterized by the pain affecting principally the region of the liver, and by its frequently terminating in bilious dejections. The pain in the *colica pictorum* occupies that part of the colon in the vicinity of the umbilicus, which last is retracted towards the spine. Stools also are rarely obtained; the abdominal muscles in permanent contraction, and the anus drawn up and indurated.

Our author's remarks on *prognosis* in hepatic colic, we shall next present in a brief and concentrated form. The disease generally admits of cure with greater or less facility, when originating from excess, or increased consistence of the bile, biliary concretions, simple plethora of the hepatic blood-vessels,

moral affections, suppressed evacuations; or when occurring in pregnant women.

It is commonly obstinate or incurable, when proceeding from alteration or stagnation of the bile; or when it is the effect of organic lesion of the liver, of abscess, scirrhus, or morbid condition of the pancreas, intestinal canal, or other abdominal viscera. Evening accessions of heat, varying in duration and intensity, and preceded by shiverings, should be vigilantly watched. They portend the commencement of suppuration in the liver, especially when accompanied by a diminution of the colic. *Cholera morbus* and the *iliac passion* sometimes, though rarely, succeed or are complicated with hepatic colic, which then is frequently fatal.

Upon the *treatment* of hepatic colic we shall not pause. It must obviously be regulated by the condition of the patient, and the peculiar circumstances of the malady. We shall content ourselves with enumerating a few of our author's remedies, conspicuous for their impotence or novelty. In the first class may be named whey, veal and chicken broth, which are dignified by the title of relaxing and anodyne drinks; and their virtues occasionally heightened by an addition of anodyne plants. The immersion of a patient "for several hours in the tepid bath, and allowing him to sleep in it," must be referred to the latter.

Anodynes, both by the mouth and rectum, are freely prescribed; and it is the opinion of M. Portal, that when the pain is very severe, they rather favour than oppose, a free evacuation by the bowels. Opiates succeed better in proportion as there exists less fever, less sanguine plethora, or tendency to inflammation. Bleeding from the arm or hemorrhoidal vessels is, our author observes, "useful in these cases, not only by obviating inflammation, but also by favouring the expulsion of the biliary concretions, as it takes off the *erethism* of the biliary tubes, and the compression which the turgid blood-vessels necessarily exercise upon them." Emetics and purgatives are contra-indicated, when an inflammatory diathesis is present. Two ounces of castor oil improperly administered in hepatic colic, our author asserts, dispatched one of his patients to the shades, with all the symptoms of high abdominal inflammation.

The symptoms and progress of *bilious fever* are pourtrayed in the commencement of the fifth chapter with great clearness and fidelity. The contents of the second section upon *prognosis*, we shall, as usual, analyze and exhibit in their most condensed form.

Favourable symptoms: Even pulse; softness of the abdomen; the urine not high-coloured on the onset of the disease, becoming so towards the close; nasal hemorrhage in the early stage; undisturbed respiration.

Unfavourable or fatal symptoms: Excessive or painful vomiting; frequent convulsive agitations, especially if succeeded by drowsiness; vomiting of black matter; dark-coloured urine; respiration laborious, short, interrupted, sighing, stertorous; tension of the abdomen, and sudden softening of it, especially if, at the same time, the patient has not had an evacuation of yellow stools. Deafness, coming on in the commencement, is more inauspicious than in the decline of the disease.

The result of dissections of those who have died from bilious fever is thus delivered by the French pathologist:

“The serous membranes are dry, of a reddish hue, as though disposed to inflammation; sometimes thickened or adherent to each other. Thus albuminous adhesions frequently take place between the dura and pia mater, the tunica arachnoides and the brain. The pleura unites to the surface of the lungs; the pericardium to the peritoneum;* the omentum to the stomach and intestines. Between these membranes also, albuminous concretions, or false membranes, are frequently formed.”

“The brain, the lungs, the liver, and other parenchymatous viscera, are of a structure more or less compact, sometimes indurated or scirrhus-like; often in a state of suppuration, particularly the liver. Serous effusions take place in the different cavities, which sometimes contain a concrete, whitish; at others, a purulent matter.”

* How could the pericardium and peritoneal membranes adhere in the ordinary structure of the internal organs? We apprehend that it is a typographical error. The passage in the original runs thus: *La plèvre (est souvent réunie) avec le poumon, le pericarde avec le peritoine, l'epiploon avec l'estomac et avec les intestins.* But we imagine, it should rather be read: *La plèvre avec le poumon; le peritoine avec l'epiploon, l'estomac, etc.*

“The gall-bladder is frequently filled with black and highly acrimonious bile, which destroys the colour of certain stuffs, and excoriates the fingers of those who touch it. Morgagni asserts, that animals, and particularly pigeons, have been poisoned by swallowing it. This bile, by its irritating qualities, may produce cholera morbus, with inflammation, erosion, and even gangrene of the intestinal canal.”

“The heart is often compact, and diminished in size. The left ventricle, the aorta, and its branches are empty. On the other hand, much black congealed blood, mixed with albuminous concretions, is accumulated in the right cavities of the heart, in the venæ cavæ, vena portarum, and other large veins.”

Many inert remedies are mentioned by M. Portal, in the *treatment* of bilious fever. Veal and chicken broth, with beet-leaves, lettuce, and sorrel; clarified whey, infusion and syrup of violets; almond emulsion; syrup of water lily and poppy. On the decline of the disease, he purges the bowels with a mixture of tamarinds and cassia-pulp in whey, or with a few drachms of soluble tartar (tartrite of potass) in weak veal broth; observing, with superstitious reverence, the maxim of Hippocrates, *Purgantia non oportet donec febris remiserit.*

Among the energetic and really valuable remedies, we remark emetics; abstraction of blood from the foot or hemorrhoidal vessels; blisters to the legs; pediluvium, and the tepid bath. Speaking of the latter, our author observes,

“Some of these patients I have left for hours, in an almost cold bath; this practice has been repeated during many successive days with excellent effect, and especially towards night, when there was great restlessness. Patients, whom I have attended in ardent fever with furious delirium, and would drink little, have been kept in the water four, five, or six hours at a time; they were only calm then, and recovered without other remedy. In some cases, where there was intense fever, and universal burning heat, I have advised the patient to be plunged, for eight or fifteen minutes, into the cold bath, with signal advantage. But, in general, the luke-warm bath*, long continued, has seemed to succeed better than any other.

* Les bains dégoûdis. Baths with the chill just taken off.

especially when the functions of the brain were more or less disturbed. This morbid state frequently depends upon congestion of the cerebral blood-vessels, which the cold bath would only serve to aggravate."

We now come to the sixth chapter on *bilious colic*. It opens with three histories of the disease, borrowed from *Valsalva* and *Bianchi*. Dissection showed, in the first, extensive inflammation of the small intestines and serous effusion in the ventricles of the brain; in the second, inflammation and lividity of the intestinal canal with many "black spots" on the peritoneum; in the third; effusion of pus into the peritoneal cavity; sphacelus of the small intestines, especially the ileum, and of the neighbouring parts of the mesentery and mesocolon.

The results of a fourth case from our author's practice, we present with our wonted conciseness to the reader.

Morbid appearances: Duodenum highly inflamed and internally excoriated; the other small intestines of a very red colour; the colon affected with inflammation; the stomach marked with blackish gangrenous specks; considerable effusion of reddish fluid into the peritoneal sac; the liver enlarged, red, and indurated; the gall-bladder filled with blackish bile.

Symptoms: Violent pain in the umbilical region, after scanty but severe vomitings of bile, felt principally in a transverse direction, between the stomach and navel, a little to the right and deeply seated; hard but useless efforts to vomit; afterwards, copious evacuation of bile by the mouth and rectum; accession of fever with daily exacerbations; the abdomen universally painful and tense; the tongue red, and vault of the palate covered with aphthæ; disease terminating fatally on the sixth day. The subject of the case, a stout man, aged 40; attacked during the heats of summer. He had used violent exercise, after eating a large quantity of unwholesome fruit, and indulging unduly in wine and spirits.

We subjoin the practice employed in this case. Remedies: Weak infusion of chamomile; emollient injections; anodyne julep; injections made purgative with mercurial honey; chicken broth; tepid bath; infusion of lime-tree and other antispasmodic plants; orange-flower water, with Hoffman's anodyne (spiritus ætheris sulphurici compositus) and Sydenham's anodyne drops (a vinous preparation of opium.)

In his remarks upon the nature and causes of bilious colic, M. Portal draws the line of distinction between this affection and the hepatic colic. The latter has its seat in the internal biliary tubes of the liver, in the gall-bladder, the cystic, hepatic, or common ducts, and is not accompanied by pyrexia. The former seems to affect originally the duodenum, but often extends consecutively to the small intestines and colon; and fever, he adds, for the most part attends it. Yet, with an inexplicable want of consistency, M. Portal asserts shortly afterwards, that "bilious colic is frequently without fever."

Our author attributes the production of bilious colic to the superabundance and acrimony of the hepatic secretion, which thus becomes unduly stimulating to the duodenum and whole intestinal canal. Severe pain in the region of the duodenum; cardialgia; obstinate constipation or exhausting diarrhœa, with tenesmus, nausea, flatulence, vomiting of aliment or bile; convulsion of the trunk and extremities, constitute principally the assemblage of symptoms. The pulse is frequent, unequal, but not hard or strong, as in hepatic inflammation, which hence may be distinguished from bilious colic. When fever is present, flushing in the hands and feet; increased weight and temperature of the head; giddiness; bitter mouth; are experienced. Hiccough, vomiting of black matter, and syncope, are the usual forerunners of dissolution. The disease is frequent in warm climates, especially during the fruit season. Violent exertion of the mental or corporeal powers; excesses in diet; indulgence in spirituous liquors or highly seasoned food, and the use of bad butter or putrid fish, greatly favour its attacks. Infancy and manhood are more prone to it than advanced age. It affects persons of a bilious temperament, melancholics, and hysterical women, more frequently than others.

Bilious colic is evidently considered by our author as a spasm of the intestinal canal, and particularly of its duodenal portion. On this point of doctrine, we cannot entirely accord with our author; for although the affection, induced by the too stimulating or other morbid properties of the bile upon the alvine tube, be at first purely spasmodic, as we are willing to allow it may be, yet we are persuaded, that it never assumes a severe or a menacing aspect, without the occurrence of inflam-

mation, in a degree more or less decided. The mucous membrane of the duodenum is, we believe, the precise seat of this inflammation; and while it remains confined to these limits, no tension of the abdomen is manifested. But the inflammatory action diffused to the ileum, the features of iliac passion are developed: again, it may, under some circumstances, pervade the whole track of the intestines, involve their peritoneal covering, and thus extend to the layer of that membrane which lines the abdominal muscles. In this event, tension of the belly, and all the dire phenomena of enteritis, display themselves. Hence, the gangrene, sphacelus, serous or purulent effusions, evident consequences of increased action, which have commonly been shown by dissection to exist in these cases. Let us turn and observe how completely the observations and histories of M. Portal confirm our reasoning upon this question of pathology.

"Frequently," he writes, "these colics (bilious) have been so inflammatory as to terminate in suppuration or gangrene of the bowels, or abscesses of some part of the abdomen." Again: "There is often no tension of the abdomen; this serves to distinguish it from a state of inflammation; yet inflammation, nevertheless, sometimes takes place in bilious colic. Then cholera morbus, or the iliac passion, is its frequent consequence."

In this view, the cases and dissections which we have noticed in the beginning of this chapter, particularly the fourth, from our author's observation, are at once clear and conclusive. The internal *excoriation* of the duodenum; the inflamed state of the other small and large intestines; the gangrenous spots of the stomach, and peritoneal effusion, are phenomena, the origin and order of which, no one availing himself of the attendant light of clinical observation, can surely mistake.

The only important remedies which we notice in the section, *Treatment*, are vomits, to be employed only when there exists no fever, nor severe pain and tension of the epigastric region; emollient and anodyne injections; abstraction of blood from the arm or hemorrhoidal vessels. British practitioners would, we presume, in a disease like this, prefer calomel to "magnesia," and blisters and the hot bath to "chicken-broth"

and "tamarind-water." Infusion of nut-galls, alum, and cream of tartar, are recommended as prophylactics. There are endless repetitions and much obscurity in this chapter. We rejoice in having reached its close.

Inflammation of the liver and its consequences forms the important subject of the seventh chapter. It occupies almost seventy pages. Nineteen histories of this affection are quoted from various pathologic writings. In all of them, the liver displayed inflammation or its evident effects. The substance of the organ, in two of them, was found utterly destroyed. Four of them were complicated with inflammation, adhesion, induration or abscess of the lungs, and thoracic or pericardial effusion: two, with inflammation or gangrene of the diaphragm: four, with the existence of gall stones: three, with enlargement or gangrene of the spleen; in one instance, this viscus adhered to the enlarged liver: two, with lividity and gangrene of the stomach from previous inflammation: four, with inflammation and gangrene of the intestines, or peritoneal effusion: one, with destruction of the omentum: one, with contraction of the aorta in its thoracic and abdominal portions. This last we are inclined to consider an adventitious circumstance, wholly unconnected with the morbid state of the liver.

Three of these cases we shall concisely exhibit. They possess considerable interest; and the works, in which they are originally recorded, cannot be accessible to the generality of our readers.

1. Morbid appearances: The substance of the liver utterly destroyed, its membrane only remaining, sac-like; the parietes thickened, and containing a quantity of fluid like the washings of flesh. Symptoms: Hepatitis, followed by the *fluxus hepaticus* of six months duration; extreme marasmus; discharge per anum of fluid, resembling that discovered, after death, in the hepatic cyst. Subject, an adult male. *Bontius, Lieutaud, 787.*

2. Morbid appearances: Liver enlarged; externally, of a red-brown colour, internally, quite filled with fœtid pus, "so as to resemble, on the evacuation of this fluid, an hollow sac: the gall-bladder so enormously elongated as almost to touch the crest of the os ilium, and filled with a blackish fluid; the intestinal canal distended with air; the colon much dilated at its

extremities, but greatly contracted in the vicinity of the spleen. Symptoms: Hepatic inflammation, apparently cured; in the progress of convalescence, shiverings; recurring every evening, and succeeded by increased heat; the surface of the body assuming universally a deep red colour; the urine also becoming red; progressive emaciation; shiverings more frequent; fatal syncope. Subject, a man of 48 years. *Hasenorhl, Histor. morb. Epist.*

3. Morbid appearances: Body emaciated; omentum destroyed; liver inflamed on its concave surface, and verging towards gangrene; the internal membrane of the stomach affected with putrefaction; the lungs dry and universally adherent to the costal pleura; the pericardium dry, and the heart flabby and emaciated. Symptoms: *Hydrophobia*, with utter incapability of swallowing a drop of liquid; accession of fury on the third day, with inundation of the salivary secretion, and constant spitting at the attendants. Convulsions and sudden death, as by suffocation, on the fourth day. Subject, a stout man, of middle-age. *Brecktfeld, Lieutaud, 599.*

We are not informed whether this last deplorable malady was consequent on the bite of a rabid animal. Immediately afterwards, M. Portal observes: "I have seen, with M. Salmade, real hydrophobia supervene in hepatic inflammation. It was successfully treated by venæsection, soothing and cooling remedies; and subsequently, anodynes and opiates."

Ten other histories are here also presented from our author's observation, and five borrowed from the works of Lieutaud and Bertrandi. They are intended principally to illustrate the connexion and co-existence of hepatic and pulmonary inflammation. Sometimes the liver and lungs are simultaneously attacked; sometimes the phenomena of hepatitis are consequent on those of pneumonia; but more frequently, according to the experience of M. Portal, the liver is primarily, and the thoracic organs secondarily, affected by the inflammation.

The results of two of our author's most instructive cases we shall concisely exhibit.

1. Morbid appearances: Liver greatly enlarged and indurated, adherent to the diaphragm, stomach, colon, and universally to the peritoneum, by false ligaments: presenting internally seve-

ral abscesses: the gall-bladder containing black bile and many gall-stones; much fœtid water in the peritoneal sac; right lung unusually red, compact, and adherent to the costal pleura; the heart and cerebral vessels turgid with blood. Symptoms: Pain in the inferior part of the thorax and epigastric region, extending afterwards to the right hypochondrium and summit of the right shoulder; nausea; slight cough and bloody expectoration; palpitations and tremor of the heart; abdomen tense; urine very red, but copious; enormous evacuation of yellow serum, tinged with blood, by the rectum; death on the ninth day of the disease. Subject: A man of thirty years, thin, and naturally of a sallow complexion.

2. Morbid appearances: Liver of a prodigious size, and soaked, throughout a greater part of its extent, in bloody serum, but indurated in its anterior border; that portion of the diaphragm to which it adhered, greatly inflamed; its superior (diaphragmic) surface covered by a layer of false membrane: the spleen enlarged and gorged with black blood: much blood in the vessels of the lungs: the heart much dilated and full of blood, particularly the right (pulmonary) auricle and ventricle: the uterus large and filled with blood. Symptoms: Indigestion; frequent pains of the head, and nasal hæmorrhage; repeated hæmoptysis: afterwards, difficult respiration; aggravated on the approach of the menstrual flux, commonly very abundant; this discharge suddenly suppressed by mental commotion; immediate accession of violent vomiting, with severe pain in the epigastric region, *subsequently* extending to the whole right hypochondrium; jaundice; incapability of lying on the left side; abdomen becoming tumefied and hard; urine very black; hic-cough with extreme dyspnœa supervening; pulse very hard and frequent; internal sensation of great heat, the surface of the body and extremities retaining their ordinary temperature: the progress of the disease to its fatal termination rapid. Subject: A lady, aged twenty-eight years.

It seems to be the opinion of M. Portal, that in these cases, as in all where the liver and heart are suffering from co-existent enlargement, the first of these organs is primarily affected, the latter in a symptomatic and consecutive manner. On this subject we do not entirely accord with the French pathologist.

In the former of the preceding cases, we believe the liver to have been the original seat of morbid action; in the latter, the heart: and we imagine that any one, who contemplates with an unprejudiced eye the train of external phenomena which they respectively exhibit, will adopt the same conclusion. That a complication of diseased heart and liver exists much more frequently than is in general suspected, we have long been aware. It is a point of inquiry which has occupied recently much of our attention. The light we have already drawn from it, although at present feeble and imperfect, has served to explain to us some very mysterious features in the progress, some vexatious occurrences in the treatment or termination, of hepatic maladies: and we feel ourselves justified in stating an opinion, that, where certain forms of liver-disease and organic lesion of the heart are complicated, it will very often, though not invariably, be discovered, upon the minute and comprehensive examination of an intelligent patient as to the origin of his complaints, that the symptoms of cardiac derangement were *first*, those of the hepatic affection *subsequently*, manifested. On these interesting considerations we shall not now pause. We are shortly to discuss them in a direct and extended manner.

Ere quitting this department of our author's work, we shall transcribe from one of his notes some observations on pulmonary and hepatic abscess, which we deem alike novel to many of our readers, and deserving to be remembered and reflected upon by all. The perusal of them will sufficiently apologize for their introduction:

"In a body brought in for the purpose of my anatomical demonstrations, I discovered an enormous abscess of the liver; which, after having contracted adhesions to the peritoneum, opened posteriorly between the lumbar and abdominal muscles: the contained pus had found its way along the ribs *to the axilla*. In my work on pulmonary phthisis, I have recorded the history of an abscess, which had formed between the pleura and the ribs. It was believed, at first, to be empyema; but this was not the case. I have also discovered, upon dissecting a body, a large abscess of the right lung; which, a strong adhesion having been established between the

costal and pulmonary pleura, had found a passage between the intercostal muscles and *serratus major anticus*. Thus abscesses of the liver and pulmonary organs may resemble, and be confounded with, each other in the passage of their contents from the abdomen and from the thorax."

Nine fortunately terminating cases of hepatic inflammation are given from our author's practice in the second section. These we shall pass by almost without comment. A section upon "treatment," just before us, will exhibit more concisely the essence of these histories. They are detailed with great minuteness, and occupy many pages.

The third section, containing *remarks on the preceding cases*, is without interest. From the fourth, entitled *symptoms*, we extract the following judicious and correct observations upon the varieties of the pain in hepatitis, according to the particular part of the liver occupied by the inflammatory action. When the inflammation affects the right lobe of the liver posteriorly, near the vertebral column, the pain is felt there, and extends to the posterior part of the thorax; and hence the disease has often been mistaken for *dorsal pneumonia*. The inflammation attacking the liver lower down and towards the right, has been thought to be seated in the right kidney, or in the stomach, when the horizontal epigastric portion of the hepatic organ was exclusively suffering from it. In fact, the existence of inflammation in the duodenum and colon has been suspected, when the disease was wholly restricted to the concave part of the liver. Pains of the abdomen, thorax, and particularly of the extremities proceeding from the morbid liver, are considered rheumatic." M. Portal contends, that the occurrence of jaundice in hepatitis does not unequivocally announce inflammation of the concave surface of the liver. "With respect to this symptom," he remarks, "there is nothing constant: doubtless, it happens when the biliary tubes are more or less obstructed by the disease." He insists also upon the impossibility of deciding, from a view of the external signs of hepatitis, from the nature of the pain or the pulse, whether the membrane of the liver or its internal structure be the site of the inflammation. Dissection, he asserts, has repeatedly exposed the futility of these undue refinements in diagnosis. The accuracy of these assertions is, perhaps, questionable.

Inflammation of the gall-bladder may, in the opinion of M. Portal, be more readily distinguished from that of the liver, than inflammations of the different parts of the latter organ from each other; but no rules are delivered to aid us in this discrimination. This disease, "even when resolution cannot be accomplished, does by no means necessarily terminate in suppuration or gangrene. Induration of the biliary reservoir may take place; and hence proceed other chronic disorders, as vomiting and colic: the stomach, when distended with aliment, not being competent to effect, by ordinary pressure, the due expulsion of the bile from the indurated sac."

The prompt employment of the lancet, injections, the (warm?) bath, and antiphlogistic regimen, are indicated in inflammation of the gall-bladder, to prevent rupture and fatal effusion of bile into the peritoneum. Sometimes, however, adhesion takes place between the inflamed viscus and the peritoneal membrane; and pus, bile, and even biliary concretions, are evacuated externally by a fistulous opening in the abdominal muscles. Nothing worthy of note occurs in the fifth section, *on the causes of hepatic inflammation.*

From the sixth section, on *Prognosis*, we shall present, in a condensed form, whatever of the interesting or important it may afford. Hepatitis, at all times dangerous, is peculiarly so when complicated with inflammation of the lungs or diaphragm, of the stomach, right kidney, spleen, or other abdominal organs; when arising from scrofulous, scorbutic, and certain other morbid conditions of the system; when not yielding to timely and repeated venesection; when latent and insidious. It is almost always fatal, when terminating in abscess or gangrene. Hectic fever, obscure pain and weight of the right hypochondrium, œdematous swellings of the lower extremities, and diarrhœa, are fatal symptoms in the latent form of hepatic inflammation.

Hepatitis assumes a less menacing aspect when the consequence of simple sanguine plethora, especially if evacuation of blood from the bowels supervene;—when complicated with a gouty or rheumatic diathesis; because, by judicious treatment, the disease may be then diverted to the extremities; when manifest and decided in its attack. Chronic hepatitis is more

unfavourable in the male subject than in the female, who has not yet passed the period of menstruation; because, in the latter, an evacuation, highly salutary with respect to the morbid liver, may be operated at the menstrual period, or in the process of fortunate parturition.

Unfavourable appearances in hepatitis: Hæmorrhoidal flux, occurring late in the disease, and preceded by shiverings and softening of the pulse; discharge of blood by the anus, proceeding from destruction of the hepatic vessels in consequence of suppuration; frenzy; profound stupor. Favourable appearances: Copious discharge of blood from the hæmorrhoidal vessels early in the attack; abundant evacuations of healthy bile by the bowels, or of blood issuing from the dilated hepatic arteries; nasal hæmorrhage, especially when occurring from the right nostril.

Disease of the liver may be suspected, and its consequences are justly to be feared, when, after morbid affections of the head, falls, or blows, particularly such as implicate the encephalon, jaundice ensues, with disorder of the digestive functions and colic.

Dropsy, the frequent consequence of hepatic inflammation, is to be dreaded, when after this disease the countenance remains discoloured; when œdema of the lower extremities, obstinate indigestion, emaciation, slight fever, muscular debility, disordered respiration, and a slow, soft and unequal pulse are noticed. The danger of this termination will be more urgent in proportion as the secretions of the skin and kidneys may be diminished.

The last section of this chapter comprehends *the treatment of hepatic inflammation*. Abstraction of blood from the *right* arm, from the foot, from the hæmorrhoidal vessels by leeches, or from the right hypochondrium by cupping-glasses, injections, fomentations, blisters, constitute the principal remedies in French practice, during the active stage: afterwards, mild aperients, as the neutral salts, the waters of Vichy, either alone or mixed with whey or chicken-broth, tepid baths, &c. Purgatives are only indicated when disgust for food, or loaded tongue, shows that digestion is faulty; and then they must be of the mildest kind, as manna, tamarinds, cream of tartar.

“Purgatives are to be dreaded, lest they should increase or re-excite the irritation of the liver.”—The stimulating system of Brown, and the modern mercurial practice of the English schools, in the inflammatory stage of hepatitis, are equally reprobated by our author. When shivering and irregularity of the pulse denote impending suppuration, he prescribes infusion of cinchona with nitre (nitrate of potass).

With the view of removing obstructions of the liver, consequent on inflammation, and preventing suppuration and scirrhus, our author administers internally assafœtida, bitter extracts, aloes, the juices of borage, succory, and other antiscorbutic plants, with or without the acetate of potash, vegetable aperitives, mercurial preparations, mineral-waters, of the laxative and diuretic rather than those of a purgative and tonic quality: and employs externally mercurial frictions.

Some remarks upon *suppuration* and *scirrhus* of the liver terminate this chapter. Symptoms of inflammation undiminished at the end of from four to eight days after their accession (the time varying according to their intensity); pulse continuing hard and irregular; absence of cutaneous moisture; constipation; region of the liver indurated; sensation of deep pulsatory motion in that part, or discovery of it by external examination; these are the signs which portend the formation of matter in hepatitis. The last of these phenomena has sometimes been mistaken for aneurism.

The following appearances prove, beyond doubt, that suppuration has taken place:—Sensation of weight, and of obtuse, instead of the preceding acute, pain in the right hypochondrium; irregular shiverings succeeded by hot fits; evening-heats in the palms of the hands and soles of the feet; nausea; vomiting; nocturnal, or rather morning sweats; extreme weakness; syncope; and real hepatic phthisis. Sometimes, the abscess may be distinguished by external examination, in the epigastric region, below the inferior border of the last false ribs of the right side. A pasty softening, more or less extensive, surrounded by a firmer substance, indicates its situation; but if this correspond to the site of the gall-bladder, the diagnosis may become difficult. The existence of an abscess would, however, be clearly demonstrated by the concurrence of three circumstances:—a

pre-existing state of inflammation, the sudden formation of the tumour, and the certainty that the patient had never suffered from *hepatic colic*, nor had passed *biliary concretions*.

Opening its way through the diaphragm, commonly in the interval surrounded by the coronary ligament, the pus of an hepatic abscess may be effused into the thorax, or it may escape into the cavity of the peritoneum, and death is the consequence: Sometimes, however, it is discharged externally by a fistulous opening between the abdominal and lumbar muscles: or is evacuated into the duodenum by the cysto-hepatic duct; or, aided by the fortunate process of adhesion between the liver, peritoneum, and other neighbouring parts, it is poured into the stomach or the colon, and thus passes off by vomiting or stool.

Our author enumerates, among the principal symptoms of hepatic scirrhus, colic; sensation of dragging in the epigastric region; constipation of the bowels or diarrhœa, sometimes alternating; disordered respiration; swelling of the inferior extremities, sometimes in the right foot only, particularly towards evening; the face puffed in a morning; urine scanty, red, with sediment; ultimately ascites. At other times, the scirrhus terminates in suppuration and ulceration. Hectic fever, diarrhœa, night sweats, and marasmus, signalize this fatal process.

An eighth chapter, *upon hepatic phthisis in general*, closes the first part or division of the work. We, perhaps, cannot convey to our readers a more correct notion of what is meant by wasting or consumption of the liver, than by presenting our author's definition of the *symptoms* in his own language.

“The symptoms are, in the first place, those which are common to phthisis of the other organs, as emaciation, hectic fever, sweats, colliquative diarrhœa. Secondly, those which are proper to this species of phthisis, as pain, of various duration, in the region of the liver, of the stomach, the spleen, the kidneys, and thorax; about the lower part of the neck, and top of the right and sometimes of the left shoulder, extending to the arms, or felt transversely in the middle of the chest, or confined to the lower boundary of this cavity; indigestion; loathing of food; flatulence; colic; difficulty of reclining upon the left side; jaundice or yellow tinge of the complexion; urine red;

countenance red and bloated; itching of the skin; tightness of respiration, especially in ascending stairs; in many cases, palpitations of the heart; syncope; œdema of the extremities, sometimes of the right only, but more frequently of both inferior, and afterwards of the superior limbs, with effusion into the cellular membrane of the trunk; and commonly, at last, into the various cavities."

These symptoms vary somewhat in their combination and intensity.

In hepatic phthisis, the prognosis is, for the most part, unfavourable. When purulent secretion is once established in the structure of the organ, the case may be considered, with some very uncommon exceptions, hopeless. Several of its species, especially if the hectic fever be established in a decided manner, seem utterly incurable; some, even in their earliest stages.

Yet a feeble hope of a fortunate result may be indulged, if suppuration of the liver have taken place in a strong man, consequent on an external cause, and without hectic fever; if the abscess burst externally, or present so as to become accessible to surgical operation; but even here, the result must be exceedingly dubious. The only chance of treating with success the disease from an internal cause, is to assail it immediately on its origin; but the termination will be, in general, fatal. Diarrhœa and colliquative sweats announce approaching dissolution. Wasting of the liver is very frequently the consequence of unsubsided hepatitis.

The liver, in persons who have died from hepatic phthisis, is found variously diseased; sometimes in a state of suppuration so universal, that the whole internal structure of the organ is destroyed, the investing membrane remaining entire, or ruptured in one or more places, and the pus consequently evacuated into the abdomen, stomach, intestines, or thorax. One centre of suppuration, variously sized, may exist alone, or there may be great numbers of them, superficial or deeply seated; isolated or communicating together. These abscesses are frequently contained in excavations of the liver, the parietes of which are irregular, and more or less corroded. The pus contained in them varies greatly in colour, consistence and other physical properties. Different parts of the liver often fall suc-

cessively into a state of induration and suppuration; so that on examining, after death, a victim of this disease, the process of morbid alteration may be seen in all its various degrees and stages. Sometimes the liver is partially or universally indurated; sometimes interspersed with *graniform concretions* of different sizes and consistence, of a reddish or white colour, entire, or affected, more or less completely, with suppuration.

M. Portal has seen, in subjects who have died of the most clearly-marked form of hepatic consumption, "the liver greatly hardened, and full of variously-sized *granulous concretions*; their consistence such as to resemble *verrucous* indurations of the skin." He has observed "other portions of the liver, the internal structure or surface of which displayed a kind of *caruncles*, red or black in colour: from which a quantity of blood flowed on light pressure, as from compressed piles."

The liver may be greatly enlarged in hepatic phthisis, so as to occupy an enormous space in the abdomen, and produce alarming or fatal symptoms by compression and derangement of the other abdominal, or of the thoracic viscera. This enlargement may implicate one lobe, or one part of the liver only, so that the figure of the organ may be variously altered. On the other hand, the liver may be diminished to a fifth or sixth part of its original size. This change may take place irregularly, and be complicated with softening, rather than induration, of the organ, though the latter frequently occurs in a very great degree. The liver has been found nearly destroyed by ulceration, commencing internally or externally, either upon the convex or concave surface. The substance of it has been seen affected, *at the same time*, with softening and induration in different parts.

Adhesions of the liver to the several abdominal organs are very common in hepatic phthisis; whether it be the consequence of hepatic inflammation, or result from a scrofulous taint. These adhesions may be formed between the original membranes of the different viscera, or by intermediate membranes of new formation. The latter are very common, and are often in a state of ulceration.

The liver, in hepatic phthisis, is rarely in a solitary state of disease. Either itself has become affected by some morbid

change of the neighbouring organs; or the malady, originating in it, has been subsequently propagated to them. The vena portarum too, in these cases, is commonly found more or less dilated, and gorged with black blood. Nor to the abdominal organs only are these morbid alterations confined: the lungs, heart, and brain, are frequently found diseased in the subject of hepatic phthisis; but whether the lesions, detected in them, took place simultaneously with, or subsequently to, that of the liver, it is often difficult, if not impracticable, clearly to determine.

Effusions of various fluids in the peritoneal cavity have been noted in this disease, and probably decided the fatal termination; as, under these circumstances, the morbid alteration of the liver has many times been far from having attained its most advanced and mortal stage.

While some patients pass on to the last stage of hepatic consumption, and perish with all the symptoms characteristic of that advanced period, marasmus, diarrhœa, and colliquative sweats; others there are, suddenly cut off by morbid affections arising in some contiguous or more remote organ, during the progress of the primary, or at least predominant, disease; such as vomiting of blood, *melana*, anasarca complicated with ascites, hydrothorax, effusion into the brain, dysentery, cholera-morbus, iliac passion, &c. Thus hepatic phthisis, in its progress and in its close, is alike dangerous.

The *treatment* of this affection will not detain us long. As this is rarely an essential or independent malady, it is necessary to investigate its causes, so as, if possible, to obviate them, to retard its progress, or attempt its radical cure. Each peculiar species, if it can be determined, must be combated by appropriate treatment. The occurrence of the disease from hepatitis will be most certainly prevented by repeated bleedings. Sinapisms, blisters, sudorifics, and alteratives, are indicated in hepatic phthisis with a gouty or rheumatic diathesis: aperients and diuretics, when it is complicated with dropsy: the prompt re-establishment of certain evacuations, when the hepatic disease is induced by their suppression.

The external remedies are relaxing, anodyne, or stimulating cataplasms; counter-irritation by blisters, *moxa*, setons, to pre-

vent internal suppuration. If this process be, however, determined, notwithstanding every effort to prevent it; and the collection of matter, presenting externally, can be clearly distinguished from the tumour formed by a distended gall-bladder, its contents should immediately be discharged by a surgical operation.

We had nearly forgotten to mention that M. Portal, in citing the general results of dissection in *hepatic phthisis*, makes the following assertion: "sometimes, no trace of ulceration or suppuration can be detected in the *liver*: in the same manner, *pulmonary* consumption may occur without any suppuration of the *lungs*." This sentence we do not accurately comprehend. We wish that our author had entered into an explanation of it. Here the first division of the work terminates.

The second part, upon *the condition of the liver in various maladies, which are believed to have their origin in other organs; and which terminate, for the most part, in phthisis of the hepatic viscus*, occupies three hundred and twelve pages: twenty-two articles, of considerable interest and merit, are comprehended in it. They are thus arranged and entitled:

ART. 1.—On the condition of the liver in some catarrhal affections, and the hepatic phthisis consequent on them.

ART. 2.—On the condition of the liver in eruptive diseases, and the hepatic phthisis which frequently succeeds them.

ART. 3.—On the condition of the liver from a scrofulous taint, and the scrofulous phthisis.

ART. 4.—On the state of the liver in syphilitic diseases, and hepatic phthisis from the same cause.

ART. 5.—On the state of the liver in scorbutic disease, and on the hepatic phthisis succeeding it.

ART. 6.—On the state of the liver in gouty and rheumatic affections, and on the hepatic phthisis frequently succeeding them.

ART. 7.—On the state of the liver in rickety subjects, and on phthisis of the liver from this cause.

ART. 8.—On the state of the liver after violent emotions of the mind and severe pain.

ART. 9.—On the state of the liver before, during, and after intermittent, remittent, or continued fevers; and on the phthisis of the liver frequently supervening.

ART. 10.—On the condition of the liver in some dropsies.

ART. 11.—On the condition of the liver in some persons who have experienced great difficulty in respiration.

ART. 12.—On the state of the liver after palpitations of the heart, syncope, and angina pectoris (stenocardia.)

ART. 13.—On the condition of the liver in some persons who have been troubled with nausea, indigestion, and different evacuations by stool and vomiting.

ART. 14.—On the condition of the liver after bilious vomitings.

ART. 15.—On the condition of the liver after vomiting blood.

ART. 16.—On the condition of the liver in some persons who have suffered from *melæna*.

ART. 17.—On the condition of the liver after diarrhœa.

ART. 18.—On the condition of the liver in persons who have died of dysentery.

ART. 19.—On the condition of the liver after evacuations of pus by stool and vomiting.

ART. 20.—On the condition of the liver in persons dead of the hepatic flux (hepatirrhœa.)

ART. 21.—On the condition of the liver in persons dead of cholera-morbus, or of the iliac passion.

ART. 22.—On the condition of the liver after contusions of various parts, or violent exertions of the body.

It would afford us pleasure to exhibit to our readers, in an English dress, some of the more luminous and instructive of these articles. But our examination of the work has already been extended to a great, perhaps, by some considered an unprofitable, length: hence, we must content ourselves with a simple enumeration of them.—Probably, the selection department of our subsequent numbers may be enriched with extracts from some of the most valuable. The motives which have excited us to an examination thus protracted and minute are, at least, laudable. They who, unacquainted with the language, or scared by the bulk of the original work, would have remained strangers to its contents, may find much of its most important matter concentrated in our pages.

In perusing the labours of M. Portal, various feelings have

been excited within us. We have found much cause for admiration and applause—too much for reprehension and regret. Wearisome diffuseness and repetition in style, cast a deep and unfriendly shade over a production, the intrinsic value and excellencies of which yet shine conspicuous amid these accumulated defects. The author is probably far advanced in years. We imagine that, throughout his work, may be descried the traces of a mind, which, although damped by age and infirmity, must have been splendid in its meridian. The “*Maladies du Foie*” may, in fact, be regarded as a valuable accession to the records of morbid anatomy. And we are persuaded that any man, who, sufficiently versed in pathology, and expert in the art of translation, should present this work, stripped of all superfluous ornament and circumlocution, to the English reader, would acquire credit for himself, and confer an important benefit upon the profession. Arrangement of the numerous cases and varieties of organic lesion, according to the *essential* phenomena exhibited by them in the living subject, would, perhaps, enhance the utility of such a work. And these, with all the valuable observations of the celebrated professor, properly condensed, might be comprehended in a volume, little more than half the bulk of the original. In the mean time, the long and laborious analysis we are just closing, will, it is presumed, afford to our readers an impartial and tolerably correct view of the French doctrine and practice in morbid affections of one of the most important and frequently deranged organs of the animal economy.

Traité des Poisons, tirés des Règnes Minéral, Végétal, et Animal, ou Toxicologie Générale, considérée sous les Rapports de la Physiologie, de la Pathologie, et de la Médecine légale. Par M. P. ORFILA, Naturaliste Pensionnaire d'Espagne, Docteur en Médecine de la Faculté de Paris, Professeur de Chimie et de Physique; Précédé du Rapport fait à la Classe des Sciences Physiques et Mathématiques de l'Institut de France.—Tome I. Ire Partie. pp. 304. Ite. Partie. pp. 325. 8vo. Paris, 1814.

[From the Edinburgh Medical and Physical Journal for January, 1815.]

THESE two volumes treat of the corrosive and exsiccant poisons, and are but part of a complete treatise on poisons which the author intends to publish. From the specimen he has given us, we shall be impatient to possess the whole, although we can by no means agree with the committee of the Institute of France, appointed to report on M. Orfila's manuscript, in the general censure thrown upon all preceding writers on toxicology. It is evident that both the author and the reporters were unacquainted with some of the best writers on the subject, and especially with the laborious and correct compilations of Gmelin,* whose research scarcely a single fact then known has escaped. In correcting this historical error, we have not the least intention of detracting from M. Orfila's merit, which we fully appreciate.

In his general arrangement and classification of poisons, M. Orfila has followed Fodéré; but as he seems to be sensible of its errors, and only to have adopted it because he was not prepared to substitute one of his own, we shall not stop to criticise it.

M. Orfila begins his work on corrosive poisons, with an account of their *general* action, the general symptoms, and the organic lesions produced by them, and their general treatment.

* Gmelin (Johann Friedrich) Allgemeine Geschichte der Pflanzengifte. Zweite vermehrte Auflage. 852 pp. 8vo. Nurnberg, 1803.

————— Allgemeine Geschichte der thierischen und mineralischen Gifte; mit einer Vorrede von Blumenbach. Zweite Auflage 391 pp. 8vo. Erfurt, 1811.

In this part of his work M. Orfila has completely failed, and we believe it is impossible to succeed in it. The action of each poison is so exceedingly various, according to the circumstances under which it is exhibited, and the state of the system on which it acts, that it seldom admits of being generalized; but a general description of the effects and treatment of corrosive poisons, under which denomination are included many substances, having very little analogy in their action, and some acting upon totally different principles, must either be so vague as to convey no information, or must consist of an assemblage of errors.

In treating of the individual poisons, M. Orfila speaks in succession of their chemical and physical properties—their physiological action—the general symptoms they produce, illustrated by cases—the organic lesions they produce—the application of the preceding facts to the different cases which may occur in medico-juridical practice, and the manner of counteracting their effects, with an inquiry into their alleged antidotes.

The facts relating to the physical and chemical history of each poison are well chosen, and perspicuously narrated and explained; but we were particularly pleased with finding an accurate account of their habitudes, with many vegetable and animal matters, for which the best systematic works on chemistry will be consulted in vain, although their knowledge is of the greatest importance to the juridical physician. Every chemical writer describes the manner of detecting the usual mineral poisons, and their action upon various reagents; but their description is taken from experiments made upon the substance in a simple state, or dissolved in water. In juridical practice the circumstances are totally different. The substance and its quantity are not only unknown, but it is almost always mixed with other substances, which suspend or alter the common effects of reagents upon it; so that our knowledge of pure chemistry may sometimes mislead us. The perusal of M. Orfila's work cannot fail of convincing every physician of the necessity of studying the objects of juridical chemistry more minutely than the general chemist will ever condescend to do.

Corrosive sublimate is decomposed, sooner or later, and con-

verted into the submuriate, by almost all vegetable substances, distilled waters, extracts, oils, syrups, honeys, gums, and alcohol. Its action upon albumen is so marked, that it has been proposed by Dr. Bostock as the most delicate test of that animal oxide; but in sufficient quantity it also coagulates milk, and causes a precipitate with gelatine, and in beef-tea. It is precipitated red by osmazome, and orange by bile; and it acts remarkably on fibrine or flesh, corrugating and hardening it. But the manner in which the presence of these substances alters the action of the reagents or tests is still more worthy of notice. The precipitate obtained from mixtures of corrosive sublimate, with boiled beans and broth, or albumen, vegetable broth, boiled apples, tea and sugar, was not blackened by lying in lime-water for two days, (p. 83, Vol. I.) yet yielded mercury by sublimation. Dissolved in Burgundy wine, it was precipitated black by potass, very dark green by ammonia, blue, passing to violet by prussiate of potass, and syrup of violets was changed by it to green. Dissolved in beef-tea, it is precipitated white, or gray or black by potass, and dirty white or yellowish by lime-water, and the addition of bile to a solution of corrosive sublimate prevented it from being affected by ammonia or potass.

In regard to arsenic, the necessity of being able to detect it, when disguised by the presence of other matters, is more obvious, as it does not discover itself by its taste, and is therefore more likely to be employed for committing murder than any other mineral poison. Solutions of albumen, or gelatine, and common beef-tea, and bile, were not affected by the addition of arsenic, and did not affect considerably the action of the common reagents. Strong tea, however, completely altered them; so that nitrate of silver gave a yellowish white precipitate, which became instantly black, lime-water a dirty canary yellow, and sulphate of copper a reddish violet; sulphuretted hydrogen alone furnished its usual yellow precipitate. Decoction of coffee with arsenic was precipitated of a deep yellow by nitrate of silver, of a grass green by ammonia-sulphate of copper, of a golden yellow by sulphuretted hydrogen, and yellow by lime-water. Wine with arsenic gave deep yellow by sulphuretted hydrogen, bluish-black by ammonia-sulphate of cop-

per, and white by nitrate of silver: with a larger proportion of arsenic, the copper yielded a green precipitate. Arsenic mixed with milk was also difficult to detect. All these mixtures, evaporated to dryness, and treated with distilled water, indicated the presence of arsenic, by one or other of these tests; and from all of them, metallic arsenic was obtained, by reduction with potass and charcoal. These are all the facts of this nature in regard to arsenic given by M. Orfila, but they are far from being sufficient; and we regret that want of room obliges us to postpone many corrections and additions which our experience could afford.

Tartar emetic gives an orange precipitate, containing oxide of antimony, when mixed with vegetable juices and decoctions. The tincture of gall-nuts is its most delicate test, and furnishes a copious curdy dirty yellow precipitate. One part of a saturated solution of tartar emetic, mixed with ten of red wine, remains transparent, but the mixture yields a reddish yellow precipitate, on the addition of some drops of hydrosulphuret of ammonia, or hydrosulphuretted water, and becomes green on the addition of a larger quantity of the reagent; with tincture of galls the precipitate is clear violet, and with sulphuric acid deep violet. One part of the solution, with ten of strong tea, remains transparent, but the mixture is precipitated deep red by hydrosulphuret of ammonia, and yellowish-white by sulphuric acid; but is merely rendered turbid by tincture of galls. Albuminous or gelatinous fluids or bile do not seem to alter the effects of the reagents in this case.

A solution of nitrate of copper is precipitated of a reddish yellow by tea. When mixed with red wine, in the proportion of one to ten, it remains transparent, but the mixture is precipitated black by the hydrosulphurets, marron brown by the precipitate of potass, and very dark gray by ammonia, which does not redissolve the precipitate entirely, and never gives a blue colour to the fluid. Acetate of copper forms a coagulum in albuminous fluids and milk, and it seems to be rendered insoluble in water by being triturated with sugar.

Muriate of tin decomposes almost all animal and vegetable fluids, except simple syrup.

Sulphate of zinc in solution is not affected by syrup or Bur-

gundy wine, but is precipitated deep blue by tea and galls, white by albumen and gelatine, yellow by bile, and curdles milk.

Nitrate of silver in solution is not affected by tincture of gall-nuts or gelatine; but it changes the colour of tea to red and black, and precipitates albumen, gelatine, milk, and bile. Mixed with Burgundy, it is precipitated of a violet colour instead of yellow, by phosphat of soda.

Muriate of gold in solution is not affected by syrup; is precipitated reddish yellow by tea; red, chocolate, or metallic, by tincture of galls; deep purple and metallic, by Burgundy; yellowish, by albumen and gelatine; green, passing to purple and violet, by bile; and curdles milk.

Nitrate of bismuth is not affected by gelatine; is precipitated yellowish white by tincture of galls and strong tea; yellow, by bile, and coagulates albumen and milk. Burgundy gives a precipitate of a rosy or violet colour; and the supernatant liquor, which is not discoloured, loses its colour on the addition of ammonia, without yielding a white precipitate, although the hydrosulphurets prove the presence of bismuth.

Acetate of lead is not affected by gelatine; is precipitated by bile and wine, and yellowish white, by tincture of galls, or tea; coagulates albumen and milk. Burgundy, containing lead, loses colour, and gives a dirty yellow, instead of a white precipitate with ammonia; and although it is precipitated by the hydrosulphurets, the wine unimpregnated by the lead is affected in the same way; but hydrosulphuretted water precipitates the poisoned, and does not affect the pure wine.

As connected with the chemical history of poisons, we may here notice M. Orfila's directions for detecting them, chiefly for the sake of noticing the methodical manner in which he treats the subject. In regard to each principal poison, he describes minutely the line of conduct to be followed in four different cases; when the individual is still alive, and the remains of the poison can be procured; when he is alive, and there are no remains, but the matters vomited or passed by stool can be had; when he is alive, and there are neither remains nor egesta; and, lastly, when he is dead. M. Orfila duly appreciates the value of the processes recommended by different chemists, and

describes minutely the precautions to be taken, in order to render the examination in every possible case satisfactory. It would not be proper at present to enter into any detail upon this extensive subject; but we cannot omit noticing that M. Orfila was able, in several instances, to detect poison, both in the egesta, and when combined with the substance of the stomach.

Our readers will perceive the value of these facts, although we have been obliged to state them in the most concise manner, and to omit many altogether, that we may leave room for some account of a series of still more interesting observations on the actions of all the various corrosive poisons upon the animal economy; a subject upon which there are still many popular errors, and great obscurity. Upon each principal poison, M. Orfila arranges his observations under three heads,—its action upon the animal economy, when taken into the stomach, injected into the veins, or applied externally;—the general symptoms produced by it, illustrated by cases;—and the organic lesions to which it gives rise.

In order to ascertain the manner in which each poison produces death, M. Orfila has been obliged to perform a vast number of original experiments, which constitute a real addition to our knowledge of the subject. We conceive ourselves entitled to speak with confidence in regard to our author's merits, because we have been and are engaged in researches of a similar nature, and know their difficulty.

M. Orfila made experiments in several ways. He introduced the poison into the stomach in various doses, without in any way injuring the animal. Where the event was fatal, this mode of experimenting is without objection, and satisfactory; but when the substance is quickly rejected by vomiting, we are not entitled to pronounce it innocent, because no other bad effects follow. It is from not attending to this circumstance that many alleged antidotes have acquired unmerited reputation. In order to obviate this objection, M. Orfila, in many cases, injected the poison through a hole made in the œsophagus, and then put a ligature around that canal, to prevent vomiting. In some cases, no doubt, he was in this way enabled to attain his object; but the method is liable to very great objections, as the animal is subjected to considerable injury in detaching and tying the

œsophagus, and will suffer much distress from being prevented from vomiting, even supposing the substance not to be poisonous; and accordingly we find M. Orfila himself admitting that some animals, on whom the operation was merely performed without any poison being administered, died sooner than others who got poison at the same time. From our own experiments, we are satisfied, that, by much the best method of ascertaining the poisonous nature of any substance, and of tracing its effects upon the system, is, to apply it to a slight wound in some unimportant part, reaching to the subcutaneous cellular membrane. We are thus able to distinguish accurately between its local and general effects; and it is astonishing how small a quantity of a really poisonous substance, applied in this way, will produce death. The method has not been altogether neglected by M. Orfila, but only not carried to the extent it deserves. Another mode of experimenting used by M. Orfila, was, the direct injection of the suspected substance into the circulating system, by throwing it into the jugular vein. The results are undoubtedly interesting, but they are not conclusive as to the poisonous nature of any substance, for they may kill in other ways; for example, by chemical action coagulating the blood,—and yet be perfectly innocent, taken into the stomach, or inserted into a wound. We may also here notice an error into which M. Orfila has sometimes fallen, in concluding that because a substance, injected into a vein, produces different and much more violent symptoms than when taken into the stomach, it does act by absorption. But surely there is a very wide difference between the action of a substance rudely thrown into the circulating mass, and one gradually taken and insensibly blended with it. Besides, the substance may not be absorbed entire, and unchanged; and yet we are warranted, in common language, to say, that it acts by absorption, if the essential constituent by which it acts on the constitution be absorbed.

We therefore consider Dr. Lafort's proof against the absorption of corrosive sublimate, as being totally unfounded; nor do we acquiesce in Mr. Brodie's, that, when it destroys the inner membrane of the stomach, the idea of absorption is precluded. That it may, and occasionally does kill, by disorganizing the stomach, and the violent impression it makes

upon it, independently of absorption, just as a child is sometimes killed by a large draught of boiling water, we admit; but there are abundance of facts, which prove that it may be absorbed even when the part to which it is applied is disorganized. M. Orfila also seems to adopt Mr. Brodie's opinion, in regard to the immediate cause of death from corrosive sublimate; that it was not in the stomach, because its functions may be suspended for days, without death being produced, but that it was in both the brain and the heart. We doubt much, however, whether we are yet so far advanced in physiological science, as to adopt his conclusions, or admit the validity of his arguments. But this subject would require a very long discussion. We therefore postpone it to another opportunity, and return to M. Orfila, and the immediate effects of the various poisons he has examined.

The modes of action of corrosive sublimate, may be summed up in the following theses:

1. Corrosive sublimate acts instantaneously, as a chemical agent, on the part to which it is applied, corroding or disorganizing it. This action may be so intense, as to produce almost instantaneous death, (Sproegel, Experiment 4.) Where the animal survives the first impression, its death is the consequence of the inflammation produced, and is seldom very speedy.

2. Corrosive sublimate, and, indeed, every mercurial, is apt to produce a specific excitement of the system, of which salivation is a peculiar symptom; and this action may also be so excessive as to produce death.

The action of arsenic is much more obscure; but we know that it acts in a totally different manner, and upon different principles from corrosive sublimate. It is *not* a chemical caustic, and ought to be removed from among the corrosive or escharotic poisons, with which it has hitherto been classed by all systematic writers, even by M. Orfila, in whose description of the organic lesions produced by it, the bad effects of this error are evident. The primary action of arsenious acid, we think, may be summed up in the following theses, chiefly the result of a great variety of experiments, made by the late ingenious Dr. Campbell, at most of which we assisted:—

1. It does not act chemically on animal matter, living or dead.

2. Its chief effect is to produce a disease somewhat analogous to cholera morbus, whether it be taken directly into the stomach itself, or inserted into the subcutaneous cellular membrane of a remote part, or applied to a delicate membrane. In some few cases, where the action of the poison is most intense, death occurs from the sickness or fainting, without vomiting or purging.

3. Frequently a considerable interval intervenes between its being received, even in solution, into the stomach, and its action.

4. Neither paralysis of the voluntary muscles, nor convulsions, nor delirium, nor coma, nor disordered respiration or circulation, are ordinary symptoms of the disease produced by arsenic.

5. After death, we were frequently unable to discover any organic lesion, and we generally found that the inflammation was less, in proportion as the arsenic was more speedily fatal.

Copper. M. Orfila has repeatedly had opportunities of giving verdigris and acetate of copper to dogs of different size, and he has constantly remarked, that, when the dose of the latter exceeded twelve or fifteen grains, the animals perished in less than three quarters of an hour. The symptoms which preceded death, were abundant vomitings of a bluish matter, evidently coloured by the metallic salt; fruitless retchings, after he had emptied his stomach of its contents; plaintive cries; great difficulty of respiration; irregularity and quickness of pulse; frequently general insensibility; the animal couched as if dead; almost always he was convulsed; and some moments before death, general rigidity, tetanic struggles, and a great deal of foam at the mouth, were observed. On examining the body immediately after death, no contractility remained in the muscles; the mucous membrane of the stomach was covered with a bluish layer, containing a portion of the ingesta, (*matière ingérée*,) which layer was hard, as if horny, and when scraped, the mucous membrane below was of a rose colour. The trachea and bronchiæ were filled with white froth; the lungs crepitated, and exhibited some red points, upon a pale ground. The heart had ceased to beat.

The injection into the jugular, of a grain of acetate of copper in half an ounce of water, commonly causes death in ten or twelve minutes. The animal at first performs the motions of mastication and deglutition, and afterwards vomits with violent efforts; he respires with great difficulty, and is very violently convulsed; he lies down,—suddenly becomes insensible,—the rattle comes on, and he dies. On opening him, nothing remarkable is perceived in the *primæ viæ*; the irritability of the muscles seems extinguished; there is no change in the lungs, and the heart is without action.

Tin. Three-fourths of a grain of muriate of tin, in solution, injected in small quantity into the jugular vein, produced paralysis and insensibility; two grains tetanus; and six grains speedy death after vertigo. On dissection, the lungs were more or less shrivelled, and partially gorged with blood; the blood itself was dark coloured, and there was a slight redness of the mucous membrane of the stomach and duodenum. Muriate of tin, introduced into the stomach, excited violent vomiting, great depression, and death without paralysis or convulsions. On dissection, the stomach was indurated, and as if tanned; ulcerated in various parts, and of a dark red colour; and the intestinal canal contained much black thick ropy bile. The lungs were sound.

Silver. A very small quantity of nitrate of silver in solution, injected into the jugular, produced difficulty of breathing, threatening suffocation, retching, pain, convulsions, and death. On dissection, the lungs were found gorged with blood, and the heart distended with black blood. A dog took into the stomach twenty grains, dissolved in seven drachms of water, which only produced uneasiness and depression; in two days, it got thirty-two grains more, which excited frequent vomiting, from which it speedily recovered. On the fifth day, thirty-six grains were thrown into the stomach, through a hole in the œsophagus, which was immediately tied to prevent vomiting; the animal instantly suffered excruciating pain, which ceased in three hours, and died on the night of the following day. The whole mucous membrane of the stomach was dissolved into a pulp, but the lungs were healthy.

Zinc. A contracted solution of zinc, injected into the jugular

vein, produced retching, coma, and death. On dissection, no morbid alteration was discovered. Taken in large quantities into the stomach, it only acted as an emetic, accompanied with temporary uneasiness and depression; but when the vomiting was prevented, by putting a ligature on the œsophagus, the animal died, and the stomach was everywhere of a dark red colour; and the lungs were a little darker than usual.

Gold. The muriate in solution, injected into the jugular, killed, apparently by inducing suffocation; it also excited vomiting. The lungs were gorged with blood, so as to sink in water, and the heart was full of black blood. Taken into the stomach, muriate of gold proves fatal in consequence of the inflammation it excites.

Bismuth. The supernitrate injected into the jugular vein, produced retching, plaintive cries, convulsions of the limbs, palpitation, difficulty of breathing, and general depression; or vertigo, and intoxication, according to the quantity. The lungs were dark coloured, but turgid only in small portions, or wrinkled, and the left ventricle and arteries contained only a little black blood. The subnitrate of bismuth, introduced into the stomach, produced nausea, and vomiting of white ropy matter, difficult, noisy, and deep respiration, trembling of the limbs, and death. The mucous membrane of the stomach was universally inflamed or destroyed, and portions of the lungs gorged with blood, so as to resemble liver.

Acids. The sulphuric, nitric, muriatic, and phosphoric acids, when injected into the jugular vein, caused death by coagulating the blood; when introduced into the stomach, they killed by the inflammation and disorganization of that organ; and when applied to the skin, by the burn which they produced, or the suppuration which was the consequence of it. The nitrous, fluoric, sulphurous, phosphorous, oxalic, and tartaric acids, acted in the same manner.

Alkalis. Potass, soda, and ammonia, and their subcarbonates, act also in the same way. They coagulate the blood when injected into the jugular, and they corrode the stomach; but ammonia also produces tetanus and violent convulsions.

Barytes, pure or carbonated, introduced into the stomach, caused vomiting, hiccup, insensibility, convulsions, and death.

The stomach was inflamed and corroded, the lungs nearly natural. The muriate of barytes, injected into the jugular, caused great agitation, and convulsions. The respiration was not affected. The heart was distended by coagulated blood, the stomach was healthy, and the lungs nearly natural; introduced into the stomach, it produced vomiting and purging, violent convulsions of the anterior extremities and face, and greatly accelerated pulse. The stomach was of a livid red, and the mucous coat could be easily rubbed off. The left ventricle of the heart contained black fluid blood.

Lime was introduced into the stomach of a little dog, to the extent of a drachm and a half in powder. It excited vomiting, and the discharge of much saliva, but caused little distress, and the dog soon seemed to recover. In five days it got three drachms, which caused it to vomit quickly, and to be depressed, and it died in three days, without having experienced convulsions, or vertigo, or paralysis. The pharynx and œsophagus were slightly inflamed; and the mucous membrane of the stomach was inflamed throughout its whole extent.

Phosphorus, dissolved in oil, injected into the jugular vein, instantly produced exhalations of phosphorous acid by the mouth and nostrils, caused difficult respiration, and panting, and death, after having rejected a great quantity of bloody serosity, without any remarkable nervous symptom. The left ventricle of the heart contained blood as black and fluid as that which filled the right. There were several livid and dense portions of the lungs; the stomach was natural. Phosphorus introduced in small lumps into the stomach, does not at first induce any remarkable effect, but the animal falls gradually into a state of depression, and dies. The stomach is much inflamed, and contains a ropy flocculent fluid. When it is introduced into the stomach, dissolved in oil, its action is much more violent. Fumes of phosphorus and gas were exhaled from the lungs; the animal seemed to suffer exquisite torture. It then lay immoveable, and was violently convulsed before death. The stomach was perfectly disorganized and corroded. The lungs were red, gorged with blood, and did not crepitate.

Powdered glass, taken into the stomach, produced no effect.

Cantharides in tincture injected into the jugular vein, pro-

duced vertigo, stupor, and death. The blood in the left ventricle of the heart was fluid and reddish; that in the right, black, containing coagula; but exactly the same effects were produced by the injection of alkohol alone. Oil digested upon cantharides, was next tried. It soon deprived the animal of sensibility and muscular power, and induced successively tetanus, convulsions, difficult respiration, and death. The lungs were very large, and gorged with a great quantity of reddish serosity; in some parts they were livid and compact. The mucous membrane of the bladder was slightly red, and the stomach natural. Cantharides in powder, taken into the stomach, acted as a corrosive, producing vomiting, the discharge of much bloody mucus, depression of vital power, and death. The stomach is always violently inflamed, and the bladder sometimes.

Lead. The solution of the acetate, to the extent of three grains, injected into the jugular, caused only slight vomiting of white ropy matter. Five grains seemed, at first, to have no effect, but in three days the animal became depressed, and refused its food, but preserved the power of walking. On the fourth day, its gait was unsteady and difficult; its hind legs were slightly convulsed; it was very weak, and it died on the fifth day. The lungs and stomach were healthy. Thirteen grains killed instantly, without any mark of pain or convulsions, after three or four deep inspirations. The blood in the left ventricle was fluid, and of a florid red. When taken into the stomach, in powder, and in considerable quantity, it caused death, after vomiting, and insensibility. The stomach was inflamed. Given in solution, it also excited nervous symptoms, loss of muscular power, convulsive trembling of the limbs, and vertigo.

Hydrosulphuret of potass. In solution injected into the jugular it produced immediate tetanus, from which, in one instance, the animal quickly recovered, and in another he perished. The blood in the heart was florid, and in the left ventricle of a deep red. Taken into the stomach it excited vomiting, difficult respiration and depression, or, when vomiting was prevented, violent attempts to vomit, hurried respiration, panting, loss of muscular power, convulsions, tetanus, death. The stomach was found much inflamed and ulcerated, and the lungs partially gorged. The left heart contained black blood.

Iodine. M. Orfila is assuredly the first to have tried the effects of this singular and costly substance upon the animal economy, both on dogs and on himself. He first took two grains fasting, but they only excited an abominable taste, and some nausea. Next day he took four grains. He was immediately sensible of constriction and heat in the throat, which lasted a quarter of an hour, and he soon vomited yellow liquid matter, in which iodine was easily recognized. Two days after he took six grains, which instantly excited heat and constriction of the throat, nausea, irritation, salivation, and pain of stomach; and in ten minutes copious bilious vomiting, and slight colic pains, which yielded to two emollient clysters, after having lasted an hour; the pulse rose from 70 to 90, and was fuller. Next day he only felt slightly fatigued. Dogs could bear about a drachm and a half of it, if they were permitted to vomit freely; but if the œsophagus was tied, it proved invariably fatal, after exciting violent efforts to vomit, hiccup, thirst, quick pulse, and great depression. The edges of the rugæ of the stomach were always corroded and ulcerated. The lungs and other organs natural. A large quantity, two or three drachms, proved fatal to dogs in the same way, although the œsophagus was not tied; and it is worth remarking, that M. Orfila was able to detect iodine in the bluish pasty matter accompanying the stools which were first passed after taking it, or in the first matters vomited, which were always tinged yellow. One drachm and twelve grains of iodine applied to a wound in the back of a dog, acted merely as a caustic, causing a thick yellowish white eschar to slough off in three days.

To these inquiries into the mode of action of each poison upon the animal economy, M. Orfila subjoins some cases, original and selected, in which their deleterious action upon the human body was evinced; and, from the whole, he draws up a summary of the organic lesions produced by each.

M. Orfila's work also contains another series of interesting and original experiments, on the antidotes of the several poisons mentioned in it, as forming a branch of their treatment. On the properties which a substance ought to possess, in order to constitute it an antidote, he agrees with Renault,* except

* *Edinburgh Medical and Surgical Journal*, Vol. viii. p. 89.

in not requiring it to be soluble in water and animal fluids, since magnesia, the best antidote of the mineral poisons, is not soluble; and he might have also struck out from among the requisites, their being perfectly innocent when taken in large doses; for both the alkalis and mineral acids, although poisonous when given in large doses, may be legitimately considered as antidotes to each other, and are in fact used as such. In experimenting upon poisons and their antidotes, no positive conclusion can be drawn, unless the œsophagus be tied, as the recovery of the animal may be owing to the rejection of the poison by vomiting, while, on the other hand, we must be equally cautious in drawing positive conclusions from the comparative time animals survive the operation; for animals differ so much in vitality, that one, to whom no poison has been given, shall die of the effects of tying the œsophagus, sooner than another to which also a dose of poison has been administered. Hence M. Orfila concludes, that "When it is established that any poison produces inflammation, ulceration, or erosion of any part of the alimentary canal, we may, without hesitation, pronounce any chemical reagent, which prevents the occurrence of these effects, to be its antidote, at whatever period death may succeed the experiment." (Vol. II. p. 48.) Proceeding upon these principles, he rejects many of the antidotes proposed by Navier, and has established the virtues of others. The great length of this article will only permit us to attend to the latter, the knowledge of which cannot be too generally diffused. Albumen he finds, by experiment, to be the only counter-poison of corrosive sublimate; and, in fact, taken in sufficient quantity, it decomposes the metallic salt, forming a triple compound, consisting of albumen, muriatic acid, and protoxide of mercury, or calomel, which may be swallowed in large doses with impunity. It has also the great advantage of being always at hand, and, there is no danger of giving it in excess. The practical rule, therefore is, that as soon as we are called to a person suspected of having taken corrosive sublimate, we should immediately make them swallow as many whites of eggs, well mixed with water, as the stomach can contain. It will immediately decompose the metallic salt remaining in the stomach; and if it excite fresh vomiting, so

much the better. Along with this, blood-letting, &c. may be had recourse to, in order to overcome the inflammation already excited. Charcoal, lately recommended as an antidote both of corrosive sublimate and arsenic, has no such effect; and acts only mechanically, by involving their particles, as alumine, or any such substance does.

For arsenic, unfortunately, no antidote has been discovered; we must therefore content ourselves with filling the stomach with viscid and mucilaginous fluids, and exciting vomiting, combined with the antiphlogistic treatment.

Decoction of cinchona, strong tea, and astringents, in general seem to have some power against the poison of tartar emetic; but M. Orfila does not consider them as at all equivalent to emptying the stomach by tickling the throat, and renewed large draughts of warm water.

In sugar and syrup we are rather surprised to find an antidote for verdegriis, and yet it seems to rest upon good grounds. M. Marcelin Duval has collected various proofs of its efficacy upon men poisoned with verdegriis. In all, it allayed the pain and other alarming symptoms, and produced an immense quantity of liquid stools. M. Orfila has confirmed the conclusions drawn from these observations, by direct experiments on animals; and has also shown that sugar exercises a chemical action on verdegriis, and renders it insoluble in water.

Milk is the real antidote of muriate of tin, by which it is completely coagulated. The coagulum contains muriatic acid and oxide of tin, and is not deleterious.

Muriate of soda counteracts the corrosive effects of nitrate of silver.

Calcined magnesia answers very well as an antidote to the corrosive action of the acids, but must be used soon.

The sulphates of soda and magnesia are antidotes to the salts of lead and barytes. They form purging salts, which carry off the sulphate of lead and barytes.

Acetic acid is the best antidote against the effects of the alkalies.

We are afraid that we have trespassed upon the patience of our readers by the great length of this article; but we have been seduced into it, not only by the general excellence of the work

itself, but also by our own predilection for its subject;—a subject of the greatest importance, and which, we are glad to see, is daily attracting more attention, and to the advancement of some parts of which the following valuable inaugural dissertations, recently published in this university, have contributed, either by original experiment, or judicious compilation and criticism. But, alas, the satisfaction we experience in referring to these real proofs of the abilities and industry of the pupils of this school, is largely mingled with regret, that the untimely death of the first gentleman on the list, has already blasted our expectations that he would have continued to prosecute the subject, with the same intelligence and zeal that are so conspicuous in his only production.

Campbell, Donaldus, M. Diss. In. De Venenis Mineralibus Experimenta quædam, atque Observationes complectens. pp. 41. 8vo. Edinb. 1813.

Bigsby, J. J. Diss. In. Quædam de Vi Arsenici Exitiosa complectens. pp. 28. 8vo. Edinb. 1814.

Gordon, Jac. A. Tent. Med. De Arsenico. pp. 54. 8vo. Edinb. 1814.

Kinnis, Joannes, Diss. In. De Effectibus Muriatis Hydrargyri Noxiis. pp. 38. 8vo. Edinb. 1814.

BIOGRAPHY.

Memoirs of the celebrated Dr. Harvey, from Notes collected from the Bodleian Library and Ashmolean Museum.

[From the London Medical and Physical Journal, for February, 1815.]

GUL. HARVEUS, An. ætat. 10, in Schola Cantuar. primis doctrinæ rudimentis imbutus; 14, Col. Gonvil. et Caii Alumnus; 19, peragravit Galliam et Italiam; 23, Patavii Præceptores habuit Eust. Radium, Tho. Minad. H. Fab. ab Aquapend. Consul Angl. 16* fit; 24, Doctor Med. et Chirurg. Reversus Lond. praxin exercuit. et uxorem† duxit; 25, Coll. Med. Socius; 37, Anatom. et Chirurg. Professor; 54, Medicus Regius factus. Scripsit de Motu Sanguinis, et de Gen. Animal. Obiit 30 Jun. MD.CLVII. Ætat. 80.‡ (But I well remember that Dr. Alsop, at his funeral sayd, that he was eighty wanting one; and that he was the eldest of nine brethren.)

He lies buried in a vault at Hempsted in Essex, wch. his brother Eliab Harvey built, he is lapt in lead, and on his brest in great letters DR. WILLIAM HARVEY. I was at his funerall, and helpt to carry him into the vault.

In the library at the Physitians' Colledge, was the following inscription above his statue, (which was in his doctorall robes.)

GUL. HARVEUS, Natus A. D. 1578, Apr. 2. Folkston,§ in Com. Cantii, Primogenitus Tho. Harvei et Joanæ Halk. Frat. Germani. Tho. Jo. Dan. Eliab. Mich. Mat. Sorores. Sarah, Amey.

* Sic. Edit.

† Smyth.

‡ Over Dr. Harvey's picture in the great parlour under the library, at the Physitians' College at Amen-corner, (burnt.)

§ Borne in the house which is now the post house, a fair stone built house, which he gave to Caius Coll. in Cambridge, with some lands there, in his will. His brother Eliab would have given any money or exchange for it, because 'twas his father's and they all borne there, but the doctor (truly) thought his memory would be better preserved this way, for his brother has left noble seats, and about 3000 pounds per annum at least.

Under his white marble statue, on the pedestall, thus,

GULIELMO HARVEO,

Vivo,

Monumentis suis immortalī,

Hoc insuper

Coll. Med. Lond.

Posuit

Qui enim SANGUINIS MOTUM

(ut et ANIMAL ORTUM) dedit

meruit esse

STATOR Perpetuus.

Dr. Harvey added (or was very bountiful in contributing to) a noble building of Roman architecture (of rustique work with Corinthian pillasters) at the Physitians' College aforesaid, viz. a great parlour, a kind of convocation-house for the fellows to meet in belowe; and a library above. On the outside, on the freeze, in letters three inches long, is this inscription, SUASU ET CURA FRAN. PRUJEANI, PRÆSIDIS, ET EDMUNDI SMITH, ELECT. INCHOATA ET PERFECTA EST HÆC FABRICA. AN. MDCLIII.

All these buildings and remembrances were destroyed by the generall fire.

He was always very contemplative, and the first yt. I heare of yt. was curious in Anatomie in England. He had made dissections of froggs, toads, and a number of other animals, and had curious observations on them, which papers, together with his goods, in his lodgings at White-hall, were plundered at the beginning of the rebellion, he being for the king, and with him at Oxon; but he often sayd, that of all the losses he sustained, no grieve was so crucifying to him as the losse of these papers, wch. for love or money he could never retrieve or obtaine. When K. Ch. I. by reason of the tumults left London, he attended him and was at the fight of Edge-hill with him; and during the fight, the Prince and D. of Yorke were committed to his care. He told me that he withdrew with them under a hedge, and tooke out of his pockett a booke and read; but he had not read very long before a bullet of a great gun grazed on the ground neare him, which made him remove his station; he told me yt. Sir Adrian Scrope was dangerously wounded there,

and left for dead amongst the dead men, stript, which happened to be the saving of his life. It was cold clear weather, and a frost that night; which stanch'd his bleeding, and about midnight, or some hours after his hurt, he awaked, and was faine to drawe a dead body upon him for warmeth sake.

After Oxford was surrendered, which was 24 July, 1646, he came to London, and lived with his brother Eliab, a rich merchant in London, on — hill, opposite to St. Lawrence, Poultry, where was then a high leaden steeple, (there were but two, viz. this and St. Dunstan's in the east,) and at his brother's country house at Roehampton. His brother Eliab bought, about 1654, Cockaine-house, now (1680) the Excise Office, a noble house, where the doctor was wont to contemplate on the leads of the house, and had his severall stations, in regard of the sun, or wind. He did delight to be in the darke, and told me he could then best contemplate.

He had a house heretofore at Combe, in Surrey, a good air and prospect, where he had caves made in the earth, in which in summer time he delighted to meditate. He was pretty well versed in mathematiques, and had made himselfe master of Mr. Oughtred's *Clavis Math.* in his old age; and I have seen him perusing it, and working problems not long before he dyed, and that book was always in his meditating apartment. His chamber was that room which is now the office of Elias Ashmole, esq. where he dyed, being taken with the dead palsey, which took away his speech; as soon as he was attaqued, he presently sent for his brother and nephews, and gave one a watch, another another thing, &c. as remembrances of him. He dyed worth 20,000 pounds, wch. he left to his brother Eliab. In his will, he left his old friend, Mr. Tho. Hobbes, 10 pounds, as a token of his love.

He was wont to say, that man was but a great mischievous baboon.

He would say, that the Europeans knew not how to order or govern our woemen, and that the Turks were the only people [who] used them wisely.

He had been physitian to the Lord Ch. Bacon, whom he esteemed much for his witt and style, but would not allow him

to be a great philosopher, Said he to me, "He writes philosophy like a Ld. Chancellor," speaking in derision.*

About 1649, he travelled again into Italy, Dr. George, now Sir George Ent, then accompanying him.

At Oxford he grew acquainted with Dr. Charles Scarborough, then a young physitian, (since by Ch. II. knighted) in whose conversation he much delighted; and whereas before, he marched up and downe with the army, he took him to him and made him ly in his chamber, and said to him, "Prithee leave off thy gunning, and stay here, I will bring thee into practice." For twenty years before he dyed, he took no manner of care about his worldly concerns, but his brother Eliab, who was a very wise and prudent manager, ordered all not only faithfully, but better than he could have done for himselfe. He was, as all the rest of the brothers, very cholerique, and in his younger days wore a dagger (as the fashion then was, nay I remember my old schoolmaster, Mr. Latimer, at seventy, wore a dudgeon, with a knife and bodkin, as also my old grandfather, Lyte, and alderman Whitson, of Bristowe, wch. I suppose was the common fashion in their young dayes,) but this Dr. would be apt to drawe out his dagger upon every slight occasion.

He was not tall, but of the lowest stature, round faced, olivaster (like wainscott) complexion; little eie, round, very black, full of spirit; his haire was black as a raven, but quite white twenty yeares before he dyed.

I first sawe him at Oxford, 1642, after Edgehill fight, but was then too young to be acquainted with so great a doctor. I remember he came severall times to our Coll. (Trin.) to George Bathurst, B. D. who had a hen to hatch egges in his chamber, which they dayly opened to see the progress and way of generation. I had not the honour to be acquainted [with] him till 1651, being my cos. Montague's physitian and friend. I was at

* This must relate to Bacon's physiological opinions as exemplified in his *Historia Vitæ & Mortis*, the work which produced so much wit in the Tristram Shandy, concerning radical heat and radical moisture. Harvey's mode of inquiry was exactly such as Bacon pointed out in his *Nov. Organum*. But it must be admitted, that Bacon's only physiological work savours much of precedents, in the Lord Chancellor style.—EDIT.

that time bound for Italy, (but to my great grief dissuaded by my mother's importunity.) He was very communicative and willing to instruct any that were modest and respectfull to him. And in order to my journey, dictated to me what to see, what company to keep, what bookes to read, how to manage my studies; in short, he bid me go to the fountaine head, and read Aristotle, Cicero, Avicenna, and did call the neoteriques s...t breeches. He wrote a very bad hand, which with use I could pretty well read. I have heard him say, that after his booke of the Circulation of the Blood came out, he fell mightily in his practice, and 'twas believed by the vulgar, that he was crack-brained; and all the physitians were against his opinion, and envyed him; with much adoe at last in about twenty or thirty yeares time, it was received in all the universities in the world, and, as Mr. Hobbes sayes in his book, "De Corpore," he is the only man, perhaps, that ever lived to see his owne doctrine established in his life-time.

He understood Greek and Latin pretty well, but was no critique, and he wrote very bad Latin. The *Circuitus Sanguinis* was, as I take it, donne into Latin by Sir George Ent, as also his booke *de Generatione Animalium*, but a little booke in 12mo. against Riolan (I thinke) wherein he makes out his doctrine clearer, was writt by himselfe, and that, as I take it, at Oxford.

His Maj. K. Cha. I. gave him the wardenship of Merton Colledge, as a reward for his service, but the times suffered him not to receive or enjoy any benefit by it.

He was physitian and a great favourite of the Lord High Marshall of England, Tho. Howard, Earl of Arundel and Surrey, with whom he travelled as his physitian in his ambassade to the Emperor —, at Vienna, Ao. Dni. 163—. Mr. Hollar (who was then one of his excellencie's gentlemen) told me, that in his voyage, he would still be making of excursions into the woods, making observations of strange trees and plants, earths, &c. and sometimes like to be lost. So that my Lord Ambassador would be really angry with him, for there was not only danger of thieves but also of wild beasts.

He was much and often troubled with the gowte, and his way of cure was thus: he would then sitt with his legges bare,

if it were frost, on the leads of Cockaine-house, putt them into a payle of water, till he was almost dead with cold, and betake himselfe to his stove, and so 'twas gone.

He was hott headed, and his thoughts working would many times keep him from sleeping: he told me, that then his way was, to rise out of his bed and walke about his chamber in his shirt, till he was pretty coole, i. e. till he began to have a horror, and then returne to his bed, and sleep very comfortably.

I remember he was wont to drinke coffee, which he and his brother Eliab did, before coffee-houses were in fashion in London.

Ali his profession would allowe him to be an excellent anatomist, but I never heard any that admired his therapeutique-way. I knew several practitioners in this towne (London) that would not have given 3d for one of his bills; and that a man could hardly tell by one of his bills what he did aime at.

He did not care for chymistrey, and was wont to speak against them,* with undervalue.

It is now fitt, and but just, that I should endeavour to undeceive the world in a scandall, that I find strongly runnes of him, wch. I have mett amongst some learned young men: viz. that he made himselfe away, to putt himselfe out of his paine, by opium; not but that, had he laboured under great paines, he had been readie enough to have donne it, I doe not deny, that it was not according to his principles upon certain occasions to ———, but the manner of his dyeing was really and bonâ fide thus, viz. the morning of his death, about ten o'clock, he went to speake, and found he had the dead palsey in his tongue, then he sawe what was to become of him, he knew there was then no hopes of his recovery, so presently sends for his young nephews to come up to him, to whom he gives one his watch,† to another another remembrance, &c. made sign to — Sam-broke, his apothecary, in Black-fryars, to lett him blood in the tongue, which did little or no good, and so he ended his dayes. His practice was not very great towards his latter end, he declined it, unlesse to a speciall friend,—e. g. my Lady How-

* Sic Edit.

† 'Twas a minute watch, wth. wch. he made his experiments.

land, who had a cancer in her breast, which he did cut off and seared, but at last she dyed of it.

He rode on horseback with a foot-cloath to visitt his patients, his man following on foot, as the fashion then was, wch. was very decent, now quite discontinued. The judges rode also with their foot-cloathes to Westminster hall, wch. ended at the death of Sir Rob. Hyde, Lord Ch. Justice. Anth. E. of Shaft. would have revived [it,] but several of the judges being old and ill horsemen would not agree to it. The scandal aforesaid is from Sir Charles Scarborough's sayings that he had, towards his latter end, a preparation of opium, and I know not what, which he kept in his study to take, if occasion should serve, to putt him out of his paine, and which Sir Charles promised to give him: this I believe to be true; but do not at all believe that he really did give it him. The palsey did give him an easie passeport.

ORIGINAL PAPER.

Case of Inverted Uterus. By Joseph Comstock, M. D.

DEAR SIR,

HAPPENING to have my journal with me which contains minutes of the following case of inverted uterus, I with much pleasure communicate its history to you, since you have intimated that it would be agreeable to receive it. At the same time you have my permission and request to make just such an use of it as you may think proper.

On the 16th of May 1808, I was called on to visit H—— H—— of Washington county in the state of Rhode Island, where I then resided. I was called on account of an inversion of the uterus, which was total, and entirely protruded without the *os externum*, and of the size of a child's head of two years old.

The woman to whom this accident happened was upwards of thirty years of age, and had been delivered of her first child, on the 9th of the same month, seven days before I saw her. The colour of the inverted surface was very dark, or rather quite black, owing to putrid and putrefying coagula, which still adhered and appeared to form a thin layer, or coating, over the whole surface. The smell of the room was offensive in the highest degree, and every circumstance seemed to justify the conclusion that the uterus itself was in a state of gangrene. To add to the horror of the case, the woman was said to have picked or torn off a considerable piece of the inverted uterus, and an excavation, or slightly concave spot, was pointed out to me on the side of the fundus, from whence it was said to have been taken. The excavation was very plainly to be seen, but of the part removed I did not obtain a sight; but conclude that it must have been chiefly coagula, with some of the extremities of the spongy fibres adhering, sufficient to cause the concavity which remained. That

she had picked off something in the anguish or perhaps madness of her situation, was satisfactorily proved by the concurrent testimony of her attendants, or otherwise it might have been supposed that the excavation (which was larger than a dollar) had been occasioned by the removal of the placenta, the edge of which must have covered this part.

There was at the same time a discharge of serous matter which had passed through both the beds on which she lay, and been suffered to run quite across the floor of her room; this was of a serous, or watery nature, and not tinged with blood. I was assured that this evacuation was not constant, but that, before it commenced each time, the uterus gradually swelled to the size of a man's head, and that then the discharge began in a small stream, which gradually diminished its bulk, till it became of the size it now was; and that it had not been of a less size than I now saw it. This circumstance, although I cannot readily account for it, I am induced to mention, because, although the woman herself was in the lower rank of life, yet the novelty of her situation had brought about her persons on whose testimony I could rely. One circumstance, falling under my own observation in confirmation of it was, that notwithstanding the copious discharge already noticed, which had lately taken place, it was not at this time discharging any thing; and this I was desired to notice when I questioned its having emitted, in a stream, the large quantity of fluid which I saw on the floor.

I will only observe further, that if this information was correct, it is probable that the discharge took place at the openings where the fallopian tubes are inserted; it being obvious that the uterus, in its inverted position, must have become nearly full before any discharge could have taken place from these openings; and as it filled, probably swelled to the size mentioned, when a lateral position of the woman, or raising the fundus of the uterus, would be favourable for the fluid, collected in the cavity, to issue out. I see but one objection to this hypothesis, which is the smallness of the orifices where these tubes are inserted; but we must suppose them sufficiently dilated in the present instance to emit a small stream, as I think the fact unquestionable.

The circumstances attending parturition, as I have been able to collect them from the attendants, the midwife, and the attending physician, are as follow, viz. That she was taken in labour in the night of the 8th of May, that a female practitioner attended in the first instance, but that the pains being severe, the woman restless, disobedient, and as it was thought a little deranged, it was concluded to call in a neighbouring physician, who came and succeeded in the delivery of the child early the next morning. It appears that the inversion of the uterus accompanied the attempt to extract the placenta: the physician informed the midwife of the accident at the time, and expressed a certain conviction of the fatality of the case; at the same time he appears to have succeeded in reducing it within the os externum, and upon leaving her ordered strict confinement to a supine posture; which order, although perfectly judicious, was far from being strictly adhered to by the disorderly patient.

I did not meet the attending accoucheur at the house of the patient, yet I afterwards saw him and received from him some further particulars respecting this very interesting case. He informed me, that after the birth of the child, with which no extraordinary circumstance occurred, he made a gentle effort at the cord to extract the placenta, but finding that it did not advance, after a second trial, and after waiting eight or ten minutes, that he introduced his hand to feel whether there was any separation of the cake or not; but finding it still to adhere by its whole surface, he withdrew his hand and pulled at the cord; but with no more force, and he thinks not so much as he had used, without any ill effects, on other occasions; when something came forward which he supposed to be a placenta unusually large; but upon further examination, he found it to be the uterus with the placenta still adhering to the fundus with its whole surface; which he then separated; when some hæmorrhage followed, not more, however, in his opinion, than from two to three pints: then with his hand flattened he restored the uterus, as he supposed, to its right position and place, and enjoined rest; but left her, as he candidly acknowledged, without any idea of her long surviving the accident.

As this practitioner declined again visiting the patient, although subsequently called on when the protrusion again happened (which was on the same day in which he had left her,) another gentleman of considerable eminence in the obstetric art was applied to, who came a day or two after the accident, and who found her, as I was informed, much in the same situation in which I now saw her. His opinion was, however, equally strong as that of the other gentleman with regard to the fatality of the case, and he left her without prescribing any thing.

At the time I was called, besides the appearance of the inverted uterus, and the discharge therefrom, which have been already mentioned, she was labouring under nervous affections of the most violent and distressing kind; so that she supposed herself immediately in the hour of dissolution, which idea could not be chased from her mind, but appeared to be perpetually present; and I was assured that she had scarcely slept at all since her delivery.

My prognosis under all these circumstances could not be otherwise than unfavourable. I however determined not to abandon the patient without attempting something for her relief.

An attempt to revert the uterus I did not then think justifiable, after the abandonment of the patient by two practitioners older than myself; its probable utter impossibility, and especially after the assertion of an author so celebrated as Dr. Denman, that he had never been able to revert an inverted uterus, even in so short a time as four hours after the accident. Only two indications, therefore, from this view of the case, remained to be fulfilled. The first, to check the progress of the threatened, or perhaps, already begun gangrene of the uterus; and the second, to quiet the extreme nervous irritability, and thus procure sleep for the distressed patient.

Having previously experienced the powerful antiseptic effects of the wild indigo, (*Sophora Tinctoria*) of Linnæus, and believing it superior in this respect to the Peruvian bark itself, strips, wrung out of a strong decoction of this indigenous plant, were ordered to be applied to the inverted uterus; at the same time the cinchona was not omitted to be given internally. To fulfil the second intention, *opiates* in sufficient quantity to allay

the inordinate commotion of the nervous system, and to procure sleep, were administered.

In a case so apparently desperate, these circumstances wore a more favourable aspect; her pulse was regular, her voice strong, and her appetite good.

By perseverance in the remedies prescribed for the first seven days, the black colour of the inverted uterus was nearly gone, the smell was less offensive and the bulk much diminished; but the serous discharge still remained, and the extreme despondency and depression of spirits were not much abated, although the opiates administered had the desired effect of procuring sleep.

At this period the cerussa acetata was added to the decoction of wild indigo, principally with a view of lessening the discharge of serous matter; and I had reason to be satisfied with the effects of these remedies, in the rapid amendment afterwards experienced: of which I had frequent information, although the patient, being several miles distant, and in a very retired situation (more than a mile from any road whatever) was not so frequently the subject of my visits as I could have wished, for the purpose of making more particular observations upon the phenomena of so novel a case.

Her amendment was not however entirely uninterrupted, as on the fifteenth of June, (thirty-seven days after the accident) I was requested to visit her on account of her being more unwell. At this time the serous discharge, which had nearly ceased some time before, became more copious, the appearance of the inverted uterus was more red and spongy, its bulk was also somewhat larger, and it was not so much retracted within the os externum as when I had seen it last. She had also a slight cough, and quick pulse, for which I at this time prescribed a solution of tartarised antimony, combined with the camphorated tincture of opium. A solution of acetas plumbi was ordered to be continued, made with vinegar and water, for as the gangrenous appearances had changed for a pale healthy red, the indication for continuing the sophora no longer existed. From about this period her amendment became more perceptible, so that by the second day of July (fifty-four days after the accident) the inverted uterus was diminished to the size, and was much of the shape, of a large pear; and by the

twelfth of the same month, I was assured that it sometimes disappeared entirely by retraction within the os externum.

At what period menstruation recommenced I am not now precisely able to ascertain; but it was some time anterior to this period; and as the uterus in its appearance, and the symptoms at the time of menstruation, were much like those which I have noticed when I was called to her on the fifteenth of June, I am impressed with the idea that she menstruated about that time: it probably beginning thus early because she did not nurse her child; which her situation in the first weeks rendered her unable to do. This natural evacuation of the menses, however, when once restored, continued regularly at the usual periods from the inverted uterus, as I was assured upon very particular and repeated enquiries, both by the woman herself, and by her sister with whom she lived; the latter being a woman of more than common stability and understanding for one of her rank in society.

Some time after this period, and as I recollect, after the woman had gotten about, and was able to attend to some business, an irregular bred practitioner obtained some credit in this case, and as I conclude induced the woman and her friends to believe that he had reverted the uterus and restored it to its natural situation; but as I was informed by the woman herself that he applied a plaister to her external parts, and by her sister that the uterus at the periods of menstruation sometimes came partially to view,* I am disposed to think that his only merit consisted in pushing the uterus somewhat further into the vagina, and applying a plaister in such a manner as to diminish the capacity of the os externum, and thus retain it there, after having made fruitless and violent attempts at reversion.

A period of seven years and six months has now elapsed since the accident; in which period (until within the last year) I have frequently seen her and made enquiries respecting her situation. I have learned that menstruation has been regular,

* I have before observed that the uterus some time before this period disappeared entirely by retraction within the os externum. Of the appearances at the periods of menstruation, I made many and very particular enquiries; the result was, that the uterus came into view at these times; that it looked larger and redder, and that blood might be seen exuding from its inverted surface.

and that she has enjoyed good health, and been able to do the work of females usually required in the kitchen, and even, in the dairy season of the year, to make the cheese of a large farm, which in that abundant country of dairies is a frequent source of employment, and is considered harder than other kinds of work, usually performed by females.

In conclusion, I may observe, that I consider the management of the placenta as the most delicate part of practice in the obstetric art, but submit any practical deductions which this case might suggest to yourself.

I must beg that nothing contained in this account be construed as designed to throw any censure upon the other professional gentlemen who were concerned in it; the probability is, I think, very great, that there was a predisposition in the uterus to invert, or else, that the slight pulling at the cord, which the gentleman who attended represented his having used, would not have produced that effect.

As to the remedy used in this case to stop the progress of gangrene (*sophora tinctoria*) I am disposed to consider it a very powerful antiseptic; having, besides the above, used it in a great many other cases wherein mortification was threatened, or actually present, with the most decided benefit, both externally and internally. But on this head I need not further expatiate, as in Dr. Thacher's very valuable *Dispensatory** (edition of 1813) it is directed to be kept in the shops, and therefore (as it respects New England at least) may be considered as a legitimate article of the *Materia Medica*.

I am, sir, with very great respect,

Your most obedient servant,

JOSEPH COMSTOCK.

THOMAS C. JAMES, M. D.

* Since writing the foregoing account, I have observed that Dr. Thacher has not given the dose of this article. I have known many practitioners use it, without much care in this respect, as it is pretty uniformly procured in a recent state from the fields and pastures of New England, where it grows in great abundance. When used externally, this is not of so much consequence; but for internal use, half an ounce of the bark of the root, (which is the most active part of the plant) to a pound of water, boiled 15 or 20 minutes, and given from one to two table spoonsful once in from two to four hours, I consider as medium doses.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

REPORT OF THE NATIONAL VACCINE ESTABLISHMENT OF GREAT BRITAIN.

To the right honourable Lord Viscount Sidmouth, principal secretary of state for the home department, &c.

National Vaccine Establishment, Leicester-square,
June 19, 1815.

MY LORD,

The Board of the National Vaccine Establishment has the honour to report to your lordship, that a greater number of individuals has been vaccinated in the course of last year than the preceding: that several thousand more charges of vaccine lymph* have been distributed to the public; whence the destructive ravages of small pox have been diminished.

It appears from the bills of mortality of London, that the deaths occasioned by small pox have decreased in a larger proportion than one-fourth; six hundred and thirty-eight having fallen victims to that malady during the last year, eight hundred and ninety-eight during the former. Large indeed is this melancholy catalogue, which is attributable to the dissemination of variolous matter by a few interested individuals, who, from sordid motives, continue the practice of inoculating with small pox virus, and diffusing this fatal disease through the metropolis.

With the view of augmenting the benefits of this establishment, the board has lately appointed a class of Extraordinary Vaccinators, in addition to the stationary surgeons of respectability, who, having voluntarily stepped forward to contribute their assistance gratuitously, compose this class, from which it is intended hereafter to elect the stationary vaccinators.

Another class, denominated Corresponding Vaccinators, has also been established, from which a very material extension of the benefits to be derived from the Vaccine Institution

* At the different stations 4,686 persons have been vaccinated, and 32,190 charges of lymph have been distributed.

is confidently expected. Each person will, in his own neighbourhood, be a point, from which the practice will continually diverge, and through whom any communication of importance may at once be made to this board.

The Stationary and Extraordinary Vaccinators must reside in London or in the suburbs; but the Corresponding may live at any distance, or in any part of the world.

The official communications from the Medical Colleges of Edinburgh, Glasgow, and Dublin, evincing their confidence in vaccination, and the annihilation of small pox in the settlements of the Cape of Good Hope and of Ceylon, by its introduction, as formerly reported, have been insufficient to convince some individuals of the security against the infection of small pox; but it is to be hoped that the strong additional facts, hereafter stated, will produce the fullest conviction of its benefits in their minds.

From the official documents transmitted by the right honourable the secretary of state for foreign affairs, to this board, respecting the effects of vaccination in the islands of Mauritius and Bourbon, it appears, that the inhabitants have been secured against the visitation of one of the severest scourges incident to the human race, as the sequel shows. In the year 1728, the small pox swept off nearly one half of the population; in 1756, about one-fourth; in 1771 and 1772, it occasioned a comparatively less, though very great mortality; and in 1792, it destroyed one-third; and of those who survived the disease, one-third lingered out a short and miserable existence, afflicted with dropsy, marasmus, consumption, &c. It is worthy of remark, that in three times out of four, the disease was introduced by slave ships. Let the contrast now be drawn between the introduction of variolous infection and vaccine inoculation.

In 1802 vaccination was introduced from the British possessions in India, but its general use was prevented by the prejudices of the people, and the lymph, after a short time, could not be procured. In 1805, it was re-introduced, and the French government seeing the necessity of regulations, framed some accordingly; but vaccination was only partially adopted; for it did not exist in many parts of the island when the British took

possession of it. In 1811, the small pox re-appeared in the island, and about 220 persons became infected, of whom 30 died. The alarm excited by the progress of this disease prompted his excellency governor Farquhar to issue his mandate, compelling all the inhabitants to be immediately vaccinated, which energetic measure at once arrested the progress of small pox.

In 1813, an opportunity was offered of putting to the test the security of vaccination, by a slave (who came from the island of Madagascar, and was afflicted with the confluent form of small pox) having been landed and received into the hospital; many slaves and other vaccinated persons were exposed to the infection, but no one became the subject of the disease.

From the introduction of vaccination in 1802, to the 28th February 1814, it is computed that 200,000 persons have been vaccinated; and the medical practitioners unanimously declare, that no instance has occurred of small pox being contracted after regular vaccination.

In the island of Bourbon the calamitous effects of variolous disease, and the beneficial consequences of vaccination, though detailed in a more abridged form, as forcibly corroborate the utility of vaccine inoculation, from its having banished the small pox from that settlement.

The National Vaccine Board cannot omit to direct your lordship's attention to the meritorious conduct and zealous exertions of private individuals, not of the medical profession, who have not only vaccinated many hundreds every year, but have studiously maintained a supply of lymph in their districts for the perpetual renewal of vaccination. It has particularly noticed the ardent zeal of Mr. Ellis, of Rhos-farm, who has vaccinated several thousands in North Wales, without a single failure; and also of the late Rev. Mr. Holt, and the Rev. Mr. Finch, two of the earliest friends to the practice; residing, the one in Buckinghamshire, the other in a populous part of Lancashire, and who met with undeviating success; a success which puts to shame the negligent practice of some belonging to the medical profession; for, strange as it may appear, it is not the less true, that there are many places in the

united kingdom, where, though vaccination is professed, it is, in effect, never fairly practised. Lymph, indeed, has been procured from the national establishment, but it would seem only for present, and not prospective purposes; as no pains have been taken to preserve it by a succession of cases; and that too, where the population in many of the districts supplied has exceeded some thousands, and even in some of these where county hospitals are established.

In many instances the board has had reason to lament, that throughout entire districts the lymph has been lost altogether; and when thus suffered to be lost, there must surely be just grounds of suspicion, that interested motives have actuated individuals to throw serious impediments in the way of the general adoption of vaccination.

In confirmation of this conclusion, the board adds the plain and unaffected narrative of a person who, humbly situated in life, has, in the true spirit of philanthropy, been the instrument of dispensing the benefits of vaccination to an extensive neighbourhood, and of preserving a regular supply of lymph, with which many medical practitioners have been liberally furnished.

Mr. W. Jeffrey, of Cambus-baron, near Stirling, after reciting the history of his practice, which, from the purest motives of benevolence he commenced under circumstances not necessary to be detailed, thus proceeds in his communication to the board:—"Vaccine inoculation has acquired such a character for ten miles round where I dwell, that the natural small pox is not heard of. In this village there is not one child which has not been vaccinated, (excepting in two families), so universal has the practice become; and it is remarked by the inhabitants of the village, that the children are more numerous owing to their being vaccinated; and among the children that I have vaccinated, I challenge all the country round to produce any instance in which the inoculation failed to preserve them from variolous contagion, notwithstanding their being exposed to lying in bed, eating, and drinking with those infected with the small pox. I am much surprised when I hear of such backwardness in and about London to the performance of such a salutary benefit to the human race. If any one should speak

against it in any village, or in the large parish of St. Ninians, he would expose himself to the contempt of all the people.”

The National Vaccine Board has it in contemplation to enrol the names of such steady and exemplary friends, under the denomination of Honorary Vaccinators, as they cannot with propriety be included in the other orders; and it hopes to receive from this class a continuance of their valuable communications. Though it cannot be supposed that any stimulus is required to incite the active labours of such highly commendable persons, yet the board cannot in justice silently pass over such zeal, without giving some signal mark of its approbation.

Notwithstanding the accumulated and accumulating proofs of the utility of vaccination, there is reason to apprehend that variolous inoculation will still be persisted in, whereby the baneful effects of small pox must be continually propagated.

The board has with regret to observe, that although the punishment of three months' imprisonment was awarded against Sophia Vantandillo, for carrying her child, whilst under the influence of small pox, through the public streets (which infected many others, eight of whom died), the unwary and uninformed are still enticed by the hand-bills of shameless empirics, to submit their children to variolous inoculation. It is, however, yet to be hoped, that the above sentence so recently passed by the Court of King's Bench, which the Board of the Vaccine Establishment has taken every method of promulgating, may produce considerable benefit. But if inoculation of small pox be permitted, the promiscuous intercourse of the infected with society at large ought to be as speedily as possible prevented, and a receptacle* established, to which the diseased should be immediately removed; for the narrow alleys and confined courts in which most of the poor reside must tend to concentrate contagion, to render it extremely virulent, and eventually to disseminate this disease under its most malignant form.

The board selected Sophia Vantandillo as a proper example,

* The Small Pox Hospital has been lately purchased, for the use of the sick poor afflicted with fevers.

on account of the extent of the mischief occasioned by her misconduct, and that this prosecution, followed by a lenient punishment, may prevent any further wilful exposure of inoculated persons, is its fervent wish. It at the same time prosecuted Mr. Burnet, who inoculated the child of Sophia Vantandillo, and who has long circulated the most mischievous and offensive hand-bills, offering to inoculate persons with small pox gratuitously, and stigmatising vaccination as productive of the most loathsome diseases.

This practitioner having suffered judgment to go by default, has been recently sentenced by the Court of King's Bench to six months' imprisonment.

The board has a duty of the highest nature to perform;—and that it is resolved to discharge faithfully and energetically.

The board has endeavoured to form a system, regular and consistent in all its parts, conducing uniformly to one main end, namely, the universal adoption of the practice introduced by the immortal Jenner. It entertains the confident expectation that so great a blessing will be no longer undervalued, and that the labours of the good and powerful will not be rendered impotent by the ignorant and the interested. It trusts, that the wisdom of parliament will not be set at nought by the most unfeeling and worthless of the medical profession, and a disease, even more destructive than the plague, allowed to be fostered by them with impunity, and continually propagated among the unsuspecting multitude of the united kingdom.

The whole of the expenses incident to this establishment, for the year 1814, were defrayed by the vote of parliament which passed last year; but the board regrets, that in consequence of the recent prosecutions and convictions of the persons mentioned in this report, and the measures adopted for the more effectual extension of the practice of vaccination throughout the empire, an addition of 500*l.* to the Annual Grant will be necessary.

J. LATHAM,
(President of the Royal College of
Physicians) President.

SCHOOL OF PHYSIC IN IRELAND.

[From the *Philosophical Magazine*, for September, 1814.]

The Education of Medical Students is committed to six Professors. Three of these, viz. the Professors of Anatomy, Chemistry, and Botany, are on the foundation of Trinity College, and are called the University Professors. The other three, viz. the Professors of the Institutes of Medicine, of the Practice of Medicine, and of *Materia Medica*, are on Sir Patrick Dun's foundation, and are called the King's Professors.

The Lectures on the above subjects commence on the first Monday in November, and terminate on the last day of April in the succeeding year. Dissections and Anatomical Demonstrations begin with December, and end early in the following April. The Lectures on Botany commence on the first Monday in May, and continue to the end of July.

The terms of attendance on each Course of Lectures are four guineas.—The Terms for Dissections and Anatomical Demonstrations are six guineas; for which also, half of a subject for the Muscles, and half of another with the Bloodvessels injected, are furnished. The student is likewise at liberty to dissect any number of subjects he may procure at his own expense. For the use of the dissecting-room during the season, without subjects being furnished, and for the Demonstrations, five guineas are paid; or for the Demonstrations alone, four guineas.

The Students in Botany have the use of one extensive Botanic Garden, and access to another in the immediate vicinity of Dublin. The opportunities of acquiring a knowledge of other branches of Natural History are also very considerable, especially of Mineralogy, by means of the valuable collection of Leske, which is open to the public.

The Clinical Hospital, belonging to the School of Physic, is supported by a large endowment of the late Sir Patrick Dun. It is calculated to contain above one hundred patients; from which number, thirty are selected for the purpose of Clinical Instruction and Lectures. Each of the six Professors acts in succession for three months as Clinical Lecturer and Physician. A large Library of Medical Books bequeathed by Sir Patrick

Dun is appropriated to the use of the students attending the Clinical Hospital. Fee for one year to Sir Patrick Dun's Hospital is at present three guineas, which includes the attendance on the practice of the Physician in ordinary. The terms for each Course of Clinical Lectures are three guineas.

Degrees in Trinity College.—There are two classes of Medical Students at Trinity College. Those of one class are matriculated in the University. Three years afterwards, on producing certificates of their matriculation, and of their having attended Lectures on Anatomy with Dissections, Lectures on Chemistry, Botany, Materia Medica, the Institutes and Practice of Medicine, the Clinical Lectures and Practice of Sir Patrick Dun's Hospital, they are examined by the six Professors, and obtain a Diploma from Trinity College to practise Medicine. This diploma confers all the advantages of the medical degrees taken in the Colleges of Edinburgh and Glasgow.

The other class of Medical Students in Trinity College go through the regular academical course of study. Three years after taking the degree of Bachelor of Arts, having likewise completed their medical education, they are admitted to an examination before the Regius Professor of Physic, and the Professors of Anatomy, Chemistry, and Botany, in the University; and after performing the usual academical exercises, they take the degree of Bachelor in Medicine. Upon sufficient standing, writing a thesis, and undergoing a second examination before the Medical Professors of the University, the degree of Doctor in Medicine is conferred. These degrees rank with those in the Universities of Oxford and Cambridge.

As qualifications previous to examination for the diploma, the certificates of the Professors in Edinburgh are admitted for any three of the courses required to have been attended, with the exception of the Clinical Lectures, which must have been in the School of Physic in Ireland.

Certificates of attendance on the Professors in the School of Physic in Ireland are received in the Universities of Edinburgh and of Glasgow, as giving standing in those places.

A new method of operating for the cure of Popliteal Aneurism, has been employed in Dublin with the most complete success.

The operation was performed by Mr. CRAMPTON, Surgeon-General at the King's Military Infirmary, near Dublin, on the 15th of October. "The femoral artery was laid bare at the usual place, by an incision three inches in length and *compressed*, (but not tied circularly,) by a narrow tape, so as completely to obstruct the current of the blood *with the least possible disturbance to the artery, or injury to its coats*. The ligature was, by a peculiar contrivance, applied in such a manner as to enable the operator to tighten or to relax it at pleasure, without interfering with the wound. In two hours and a quarter the ligature was gently relaxed, but not completely loosened; no pulsation in the ham. In twenty-four hours the artery was relieved from all compression; but, as a measure of precaution, the ligature was left in the wound. In forty-eight hours the ligature was withdrawn, and the wound was united by adhesive plaster."

The patient was examined on the fifth day by several professional gentlemen; his health was not in the least degree deranged. The tumour, which had decreased by one half, was without pulsation, and nearly incompressible. The temperature of each foot was 84°.

On the 14th day the wound was nearly healed, and the man went about the ward on crutches.

On the 18th day the wound was healed, and the tumour, which could be seen only in the extended position of the limb, was incompressible, and altogether free from pain.

The advantage of Mr. Crampton's operation consists in its imitating in the most favourable way the process of nature, in the spontaneous cure of aneurism.

1st. By interrupting the course of the blood through the ruptured artery, the fluid contents of the aneurismal sac are allowed to coagulate, and the circulation is thrown upon the collateral branches.

2d. The subsequent obliteration of the artery is effected by a natural process, which protects the patient from the long train of sufferings, and of dangers necessarily attendant upon

the permanent contraction of a great artery, and its separation from the ligature by the process of sloughing on ulceration.

PHILADELPHIA DISPENSARY.

From the annual report, as published by the managers of the institution on the 26th inst. we find that THREE THOUSAND FOUR HUNDRED AND THIRTY THREE PATIENTS, have been attended by the physicians, from December 1st, 1814, to December 1st, 1815.

Patients remaining from last year,	-	-	-	60
Admitted since that time,	-	-	-	3373

Of these the number cured is	-	-	3077
relieved,	-	-	57
dead,	-	-	100
irregular,	-	-	26
removed,	-	-	29
remaining under care,			144
			<hr/> 3433

The receipts of the Dispensary during the past year have been,	-	-	-	-	Dolls. 2433 33
Balance due the Treasurer last year,	\$	21	74		
The expenditures have been this year,		2354	93		
Balance remaining in the Treasurer's hands,		56	66		
					<hr/> 2433 33

December, 1815.

Managers Elected, January 1, 1816.

William White,	Robert Ralston,
Lawrence Seckel,	Ebenezer Hazard,
Robert Blackwell,	Isaac Snowden,
Henry Helmuth,	Joseph Cruikshank,
Robert Smith,	Elliston Perot,
Godfrey Haga,	Samuel P. Griffiths.

Officers elected by the Managers, January 2d, 1816.

Attending Physicians and Surgeons.

Dr. Joseph Woollens,	Dr. Samuel Emlen, Jun.
Aaron B. Tucker,	John W. Moore,
David Jones Davis,	William S. Coxe.

Consulting Physicians and Surgeons.

Dr. Thomas Parke,
Caspar Wistar,

Dr. Philip S. Physick,
Thomas C. James.

Treasurer.
John Clifford.

Apothecary.
George G. Tresse.

VACCINE SOCIETY, JANUARY 3d, 1816.

Two thousand one hundred and seventy two persons have been successfully vaccinated by the physicians of the society, in the City, Northern Liberties and Southwark, during the last year.

AMERICAN PHILOSOPHICAL SOCIETY.

At an election of Officers of the American Philosophical Society, held at their Hall, after due notice, on the 5th day of January, 1816—the following Officers were chosen:

President—Caspar Wistar.

Vice-Presidents.

Robert Patterson, William Tilghman, Peter S. Duponceau.

Secretaries.

Thomas C. James,
Nathaniel Chapman,

Thomas T. Hewson,
Robert M. Patterson.

Counsellors for three years.

William White,
William Rawle,

Horace Binney,
John Sergeant.

Curators.

Zaccheus Collins, Joseph Cloud, Samuel Colhoun.

Treasurer—John Vaughan.

Census of the Humane and Criminal Institutions in the city of New York, collected by the attending minister, JOHN STANFORD, M. A.

May 1, 1815.

Orphan Asylum.

Boys and Girls,

- - - - -

101

Magdalen House.

3

City Alms-house.

Men,	-	-	-	-	-	-	183
Women,	-	-	-	-	-	-	344
Boys,	-	-	-	-	-	-	282
Girls,	-	-	-	-	-	-	241—1050

City Hospital.

Patients,	-	-	-	-	-	-	144
Maniacs,	-	-	-	-	-	-	75 —219

United States Military Hospital.

Patients,	-	-	-	-	-	-	55
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Debtors' Prison.

Committed yearly,	-	-	-	-	-	-	1400
Confined at all times, including jail liberties,	-	-	-	-	-	-	90 to 100

Bridewell.

White men,	-	-	-	-	-	-	30
Black men,	-	-	-	-	-	-	27
White women,	-	-	-	-	-	-	43
Black women,	-	-	-	-	-	-	31 —131

State Prison.

White men,	-	-	-	-	-	-	392
Black men,	-	-	-	-	-	-	88
White women,	-	-	-	-	-	-	19
Black women,	-	-	-	-	-	-	66 —565

OBITUARY.

DIED, in London, November 1, 1815, Doctor JOHN COAKLEY LETTSOM, aged 70 years.

— In Philadelphia, December 19, 1815, Doctor BENJAMIN SMITH BARTON, Professor of the Theory and Practice of Medicine, in the University of Pennsylvania, aged 48 years.

— December 28, 1815, Dr. THOMAS CHANDLER, aged 42 years.

UNCOMMON WEATHER.

Quebec, August 10, 1815.

On Monday night last the frost was so severe in the vicinity of this city, as to destroy the leaves of the cucumber plants, pumpkins, beans, and other tender vegetables. Early on Tuesday morning ice was found in many places. The frost extended both to lands in high and low situations. It is feared that much injury has been done to the wheat in this district, which had a promising appearance. A snow storm the 20th May, the trees not in leaf on the 4th June, and so severe a frost on the 7th August, are novel features, even in the climate of Canada.

THE WEATHER.

There seems to have been of late irregularities in the natural as well as the political world—but we cannot so well account for the one as the other. The extreme cold which took place the latter end of January, seems to have been extensive, and the spring was so unusually long and cold, as to damage many of our choicest fruits.

This unseasonable cold is ascribed, by some, to the vast fields or islands of ice, which come from the polar regions into the Atlantic sea, and stretch themselves for hundreds of miles along the American coast, until at length they are melted by the heat of the southern latitudes. Hence has arisen a dispute amongst philosophical enquirers. One party says, that the heat of the summer's sun melts the ice and snow in the north as fast as they accumulate in winter. The other party affirms, that in these remote regions, where are nine months of winter and only three months of summer, the ice is gradually increasing; and they instance those seas and countries which were formerly navigable and habitable, are now entirely shut up, and become impervious to man. The Siberian seas are given as a proof of this hypothesis. If it were true, there would be something alarming in it. See H. M. Williams' travels in Switzerland, for a curious paper on this interesting subject.

The drought (or drouth) which began in June, has been long and general, and has retarded the growth of that necessary

article of food for both man and beast, maize or Indian corn: and this warm weather has been suddenly succeeded by unusually cold nights and mornings. There have been partial showers, but not sufficient to moisten the parched earth, and re-animate vegetation.

In Philadelphia, we are told, the whole of July was oppressively hot and dry. About the 25th of that month, the thermometer rose to 97. A few days after it fell to 50; a vast difference at this time of the year, and showing a wonderfully variable climate. About the same time, the mercury in New York is stated to have been only up to 90, and the same at Quebec. In Baltimore, a fair medium may be set down at 94, by the best regulated instruments.—*Baltimore American.*

METEOROLOGICAL OBSERVATIONS.

State of the weather during the last six months of 1815.

JULY.

Thermometer—Lowest, at 8 A. M. 68. 4th day of the month.

Highest, at 3. P. M. 92. 25th.

Mean. . . . 80.

Winds—variable—mostly westerly. Not much rain. Long continuance of hot weather. Thermometer 92 at Montreal, middle of the month. Some cases of measles still amongst us. Few insects this summer. Good harvests of grain, and well got in.

AUGUST.

Thermometer—Lowest, at 8 A. M. 63. 7th day of the month.

Highest, at 3 P. M. 90. 1st.

Mean, 78.

Winds—between easterly and westerly. Little rain: hot weather. A very severe gale on the 9th, and another on the 30th. A good fruit year. Small pox appeared at Fishkill, State of New-York.

SEPTEMBER.

Thermometer—Lowest at 8 A. M. 50. 29th of the month.

Highest at 3 P. M. 84. 11th to 13th inclusive.

Mean 60.

Westerly winds prevalent—unusually so the last and this month, in the Atlantic. The passages from Europe have been the longest ever known. A tremendous gale of wind, of short duration, in the morning of the 23d, on the sea-board of part of New England. Little rain.

OCTOBER.

Thermometer—Lowest, at 8 A. M. 41. 30th day of the month.

Highest, at 3 P. M. 64. 15th.

Mean, 54.

Winds—southerly and westerly—little rain. Sleighing at Quebec the last of the month. The latter part of this month and beginning of the next, the catarrhal fever commonly called Influenza, was epidemic here. It first appeared to the northward and eastward. The usual symptoms occurred. Bleeding was very often necessary, with the antiphlogistic plan. Patients who were smartly handled were left much debilitated. It was mortal in some cases of previous weakness from sickness or old age.

NOVEMBER.

Thermometer—Lowest at 8 A. M. 31. 14th day of the month.

Highest, at 3 P. M. 65. 6th.

Mean 42.

Winds—westerly until the latter part of the month, when we had some easterly winds. Dry season continues; it has been unusually so during the summer and autumn. Heavy snow in the state of New York on the 2d and 3d days of the month.

DECEMBER.

Thermometer—Lowest, at 8 A. M. 16. 11th of the month.

Highest at 3 P. M. 56. 4th.

Mean 32.

Winds—Still westerly, and little rain; slight snow on the 10th; Schuylkill frozen over on the 11th, and Delaware frozen at Burlington. Considerable fall of snow on the 29th at night. Much ice in the river.

The small-pox appeared amongst us about the beginning of this month, after an absence of several years; said to be brought from New York. It does not seem to spread much. There has

been a general state of good health in this city, with the exception of the influenza. Foreign newspapers notice the great mortality of the plague; particularly at Cairo, in May. They also mention its prevalence at Constantinople. On the 6th of March, a comet, which took a N. E. course, was seen at Bremen, by Dr. Olbers, near Perseus.

RECENT BRITISH PUBLICATIONS.

An Essay towards the improvement of some important Instruments of Surgery, and of the operations in which they are employed, by William Jardine, illustrated by eleven engravings. 8vo.

Treatise on the Diseases of Arteries and Veins, &c. by Joseph Hodgson. 8vo.

Engravings to illustrate some of the Diseases of Arteries, by Joseph Hodgson, 4to.

RECENT AMERICAN PUBLICATIONS.

T. Dobson, Philadelphia, has just published, Murray's *Materia Medica*, with Notes by N. Chapman, M. D. 2 vols. 8vo.

Also, Cullen's *Synopsis of Nosology*, translated from the Latin, by Dr. Thomson. 1 vol. 12mo.

A Treatise on Surgical Diseases and the Operations suited to them, by Baron Boyer; translated by Alexander H. Stevens, M. D. with Notes and an Appendix, by the translator. 1st vol. 8vo. New York.

A. Finley, Philadelphia, has published the "Engravings of the Muscles and Joints, illustrating the Anatomy of the Human Body; by John Bell, Surgeon," containing 17 quarto plates, with copious letter press explanations.

THE
ECLECTIC REPERTORY
AND
ANALYTICAL REVIEW.

VOL. VI.

APRIL, 1816.

No. II.

SELECTED PAPERS.

Medical Topography.

From the "Natural and Statistical View, or Picture of Cincinnati and the Miami Country."

BY DANIEL DRAKE. CINCINNATI, 1815.

UNDER this head it is proposed to communicate, as fully as possible, such information concerning our diseases, and such notices of the mineral springs within our reach, as a person about to emigrate to the western country would desire.

SECTION 1. *Prevailing Diseases.*

Of the diseases connected with climate, we have most of those which are common in the same latitudes, east of the Alleghenies. Some of them, however, are less violent and frequent here than there. Of this kind is the *pulmonary consumption*; which, in the Atlantic cities, destroys from a fourth to a sixth of all who die; while in this town, it produces not more than one-twentieth of the deaths. So favourable, indeed, is this place to those who are threatened with consumption, that a migration to it from the northern states might be advantageously recommended, when this complaint is about commencing, or not very far advanced. The *pleurisy* and *peripneumony* occur every winter; but seldom prevail to any great extent. They are generally complicated with bilious affections; which

renders the treatment difficult, and makes the use of calomel, in most cases, absolutely necessary to a successful issue. The *croup* is a formidable disease in this place, annually carrying off a number of children. Like the preceding complaints, it is frequently attended with bilious symptoms; and occasionally shows itself in connexion with cholera infantum, forming a very dangerous combination. In general, it does not seem to be a worse malady here than in the east; and I have never seen it of that malignant and epidemic character at Cincinnati, which it exhibited in Virginia in 1799.* *Colds and catarrhs, swelled tonsils, and other affections of the throat*, produced by sudden changes of weather, occur here in the same manner as in the maritime states; but do not appear to be so often followed by consumption. The *premature decay of the teeth, pains in the jaw, and tooth ache*, frequent in all variable climates, are, it would seem, much less common here, than in some parts of New England; as Dr. Hazletine informs us, that they make about an eighth part of all the diseases incident to the people of the province of Maine. *Rheumatism* occurs; but is not so frequent and formidable as in the northern states.

Of the diseases ascribed to the exhalations from putrefying animal and vegetable substances, from alluvial ground, and from ponds and marshes, we have perhaps the whole catalogue, with the exception of the yellow fever of the eastern cities. In the country, especially along the water courses, *remitting and intermitting fevers*, including *ague*, prevail every autumn; but are seldom malignant, and generally yield to the treatment elsewhere employed, if resorted to at an early period. In Cincinnati, the annual prevalence of these diseases is less certain, and the *mild and malignant typhus fevers* frequently supply their places. In the years 1809, 1810 and 1811, these complaints were prevalent here, without much intermission; but since that time they have been rare.

The diseases to which immigrants are most liable, are bilious and typhus fevers. This is especially the case with the natives of New England and New York, who in coming here undergo a change of climate greater than they seem generally to suppose. They should, therefore, endeavour to arrive in the

* See Medical and Physical Journal, vol. ii.

Miami country late in the autumn; and before the ensuing summer, place themselves in the most healthy situations which can be found. Those who intend to reside in the country, should get on upland farms at an early period: those who prefer the town, should choose the eastern and northern portions, which are more exempt from noxious effluvia; and, in the heat of summer and early autumn, expose themselves as little as possible, either to the evening air, or the noon day sun. With these precautions, and a strict regard to the prevention of what is denominated a bilious habit, very few will suffer an attack; but without such attention, a *seasoning*, as it is termed, will most likely be experienced the first summer after an arrival from the north. In the second, whether the first be sickly or not, there is but little danger.

Next to our fevers, are the different complaints of the stomach and bowels. These prevail chiefly in the summer, as in other parts of the United States, and precede the fevers which have been enumerated. The *cholera infantum* is commonly the first which occurs, and sets in with the earliest intense heat. Its greatest prevalence is in June and July, when it frequently proves fatal, particularly in town. It sometimes destroys life in a few days; at other times the unfortunate little sufferer pines for several weeks, when he either dies, or is restored by the frosts of autumn. In the country this disease is less frequent, and so mild as not often to prove fatal. The *cholera morbus* occasionally presents itself, at the seasons in which it is more or less prevalent over all the states. A few cases of *dysentery* occur every summer; and once in two or three years, it is epidemic. When this is the case, its prevalence is sometimes very general, but not often mortal. Now and then it assumes a malignant character; when it is, for the most part, confined to a single family. Upon the whole, this disease appears to be less formidable in this country, than in the Atlantic states. On the head waters of the Great Miami, and in some of the adjoining parts of Kentucky, a disease called by the people the *sick-stomach*, has prevailed more or less for several years. Its prominent symptoms are, a vomiting upon taking exercise, with chronic debility, lassitude and soreness of the extremities. Sometimes it continues for months, in the same individual; and frequently affects whole families. It is supposed to extend

to horses, cows, sheep and dogs, varying in several of its symptoms. It does not often prove fatal; and the people, where it is endemic, seem to have learned by experience an efficacious method of treatment. It has been ascribed to some noxious impregnation of the water; to the use, by the animals whose milk and flesh are eaten, of some deleterious plant, and to marsh exhalation—the last of which is the most plausible. For two or three years past, its occurrence has been more infrequent, and it cannot be regarded as constituting any serious objection to the districts in which it prevails. The *jaundice* is a pretty common disease in this country; but it seldom destroys life. *Inflammation of the liver* is met with occasionally, but not oftener than in the same latitudes of the maritime states. Sore eyes (*ophthalmia*) is a disease which now and then becomes epidemic over the whole of this country. It prevails most in the same situations where the ague, and other forms of bilious fever abound; and has therefore been referred to the same cause. It does not arise from heat or dust, as it occurs oftenest in shady vallies; nor from the smoke of autumn, as it precedes that phenomenon. It is less frequent than formerly, and will perhaps cease with those diseases which are acknowledged to depend on marsh exhalation. The *periodical head-ach* is a disorder which in this country is ascribed to the same cause, and can be cured in the same manner as ague and fever.

Of the diseases termed *epidemic*, the most frequent in the Miami country are the *measles* and *hooping cough*, both of which have prevailed in Cincinnati every year or two, since 1800. They seldom affect a great number at once, but make their attacks successively for many months, and do not often terminate fatally. The *mumps* now and then occur, with no unusual symptoms. The *small pox* has not prevailed here to any extent for a dozen years. There is no institution for preserving and disseminating the vaccine virus; but a great number are annually vaccinated. The *scarlet fever* and *putrid sore throat* have been of rare occurrence. About the year 1792, they were prevalent in all the infant settlements of the west, and produced many deaths. From that time till 1809, but few cases were observed at Cincinnati. In this and the two subsequent years, they appeared in an epidemic form, and destroyed a number of children. Since that period, but few cases have

been seen, and those were of the mildest kind. The *influenza*, so extensively prevalent in 1807, attacked the people of Cincinnati about the 1st of October, and disappeared in five weeks, leaving the town unusually healthy. Very few adults of either sex, but many children, escaped it. The number of deaths produced by it was inconsiderable. The consumption, however, followed in its train, and carried off several persons in the two ensuing years. Since this visitation, we have more than once experienced wide spreading *catarrhs*, which were ascribed to changes of the weather; but it seems probable that they arose from the same causes with the *influenza*. The *spotted fever* of the northern states has never prevailed here; but its successor, the *typhoid pneumonia* (vulgarly called in this country the cold plague) affected a very considerable number in the winters of 1812-13 and 1813-14. In that of 1814-15, but few cases were met with. More men, in proportion, than women or children, suffered; and it generally attacked those who were most exposed to cold and moisture. It proved fatal in a number of cases; but was, on the whole, productive of much less mortality than in the north.

Eruptive diseases of the skin are common in the Miami country, and frequently prove obstinate. The *itch*, and a breaking out which nearly resembles that complaint, are the most common. These eruptions, however, exhibit a great variety of appearance, and are by the people ascribed to as many different causes. They seem to be more prevalent in the country, than the town. *Worms* are common, and affect children of every age, from one to fifteen years. They seldom prove fatal, unless combined with some other disease. The *goitre* is an endemic of the western portions of Pennsylvania, and the eastern part of this state; but is unknown here, except in persons who have immigrated while labouring under it. The *scrophula*, *ricketts* and *scurvy*, especially the two latter, are rare diseases. *Hysteria*, *hypochondria* and *insanity*, are not uncommon. *Dropsy of the brain* is met with occasionally. *Locked jaw* is so rare, that but a single case has occurred here for many years. *Apoplexy* is scarcely ever seen; but *epilepsy* is more frequent. *Dropsies* occur pretty often, but generally as the consequence of intermitting fever. The *gout* and *calculus* are seldom seen, and *palsies* are infrequent. *Cancers* are uncommon; and no case of

hydrophobia has occurred since the settlement of the town. *Canine madness* has not been epidemic for many years. The venomous snakes are so few, that even in the newer settlements a *snake-bite* is uncommon; and in the neighbourhood of Cincinnati, almost unknown. The *coup de soleil*, or stroke of the sun, and death from the use of *cold water*, are not more frequent. *Drowning* in the Ohio, is an accident which often happens, and one which we are entirely unprepared to remedy, not having the instruments necessary, either for the recovery of the immersed body, or the restoration of life.

As no bills of mortality are kept in this place, it is not known what proportion die annually; what diseases carry off the largest number; or which of the seasons is attended with the greatest mortality—though the two latter may be estimated and expressed in general terms. The cholera infantum is more fatal to children than any other complaint. It is most destructive in the second summer; aggravated, no doubt, by teething, and the miscellaneous food with which children begin to be indulged at that age. Convulsions, in the first month after birth, carry off many; and should perhaps rank next to the cholera infantum in the number of their victims. After this follows the croup, which for the most part attacks those between the ages of six months and two years. Of adults, the greatest number die with bilious and typhous fevers; with pulmonary inflammation, and with affections of the liver, stomach and bowels. In the months of June and July, more children die than in any others. The greatest mortality among adults is generally in August, September and October. When epidemics prevail, this however is otherwise, and the midst of winter is now and then attended with a greater number of deaths than any other part of the year.

SECTION 2. Causes of Disease.

CLIMATE.

Neither the extreme cold, nor the extreme heat of this climate, appears to produce many diseases, by its direct operation. If scurvy, goitre and chilblains arise from cold, that of our climate is not sufficient to produce them. The extremities of those who are much exposed in winter, are occasionally frozen; but there has been no instance of death from such ex-

posure in this country. The most obvious effects of our hot weather are, oppression and lassitude in the muscles, with a diminution of appetite—all of which disappear upon the occurrence of a cool day, and are thereby distinguishable from similar affections produced by marsh exhalation. Few persons escape these complaints; but those who have emigrated from higher latitudes are of course the greatest sufferers. Some aged people, and a few valetudinarians, enjoy better health in our hot, than cold weather. Our children, during the great heats of summer, are liable to *rashes*, as, they are popularly called—cutaneous efflorescences—which are troublesome, but not dangerous; and disappear upon the first occurrence of cool weather. There is even reason to believe these affections salutary, as they frequently appear on the healthiest children. Cholera infantum is not produced by the direct action of heat on the system, but is so much aggravated by that cause, as to be generally incurable during the period in which the thermometer fluctuates between 76 and 96 degrees. The variations of atmospheric temperature are a more potent cause of disease, than either extreme. But they may in a great degree be rendered harmless, by a careful adaptation of clothing, lodging and fire, to the change. This cause usually produces pleurisy, rheumatism and other inflammations—colds, quinsies, croup, tooth ach, &c. uncombined with other complaints;—but when the prevailing disease is a bilious or a typhous fever, it is commonly found, that the affections produced by changes of the weather, partake largely of the symptoms of the epidemic. The best examples of this combination are afforded by the pleurisy and croup. Variations of temperature, particularly changes from *heat* to *cold*, are sometimes the *exciting* causes of intermitting and other fevers, produced by marsh exhalation. In all these cases, the presence of moisture renders the depression of temperature more injurious. To water, indeed, in the form of dew and fog, it is fashionable to ascribe much deleterious power; but there is reason, perhaps, to doubt the correctness of this hypothesis in all cases, when the temperature of the atmosphere is *steady*.—Fogs and vapors are most abundant, where the decomposition of vegetable matter is greatest; and to this operation should perhaps be attributed most of the diseases which are vulgarly ascribed to moisture.

WATER.

Throughout the Miami country, this is generally *hard*, from holding in solution *carbonate of lime*, *muriate of soda*, *muriate of lime*, and the other salts afforded by a calcareous region. It is apt, therefore, to disagree with immigrants from a country, such as that east of the Alleghenies, where most of the springs afford *soft* water. The complaints excited by this cause are for the most part transient; and to the natives of the country, its waters are as salutary and pleasant, as those of the Atlantic states are to the inhabitants of that quarter. Our springs and wells cannot, therefore, be regarded as affording a beverage absolutely prejudicial to health, though it may operate injuriously on strangers for a short period.

MIASMATA.

The Miami country in general being level, ponds and morasses are frequent; especially in the northern part. Most of them might be drained, and certainly will be, at some future period. In the mean time, their environs must continue more or less infested with the diseases which spring from marsh effluvia; and therefore should not be selected for the residence of immigrants. Most of our valleys contain large quantities of alluvion, deposited at various antecedent periods; but whether from these tracts there be any exhalations still arising, which are noxious, is doubtful. The more obvious sources of miasmata, are the marshes formed in these tracts from the annual inundation of their lower portions; and the decaying remains of animals and vegetables deposited in the shores of the streams which flow through them. Whatever may be the truth on this point, it is certain that the valleys are less healthy than the uplands; but from clearing and cultivation, they are annually becoming more salubrious. With respect to Cincinnati, the sources of miasmata may be divided into those which are natural, and those which are artificial; or in other words, into such as are common to it, and other towns on the river, and such as are peculiar, and of our own creation. Of the former, we have but two—the drowned lands at the mouth of Mill creek; and the river beach opposite the town. The former lie so far to the west, and are so much disconnected with the

town by an intervening forest, that our summer winds but seldom blow their exhalations over us. Hence very little agency can be ascribed to this cause. The latter is, perhaps, more efficient. The great depressions of the Ohio, in August and September, expose to the sun a quantity of mud, with trees and some animal matter, in a state of decay; the exhalations from which are unquestionably prejudicial. The erection of the steam mill has augmented this cause; by producing, in high floods, an eddy, which annually deposits on the beach, for a thousand feet along the front of the town, a large quantity of filth and mud. Our *artificial* sources of disease are incomparably more deleterious. For many years the descent of gravel along the streets which run from the upper to the lower table, has kept several of the intermediate lots in a state of partial inundation, and caused them to accumulate large quantities of filth. Further west, in the same tract, nearly all the bricks hitherto used, were manufactured; and the pits whence the clay was dug, have been constantly receiving, through the gutter in Second Street, nearly all the wash of the town. Thus have we improvidently created, in the very midst of our population, the most offensive and destructive nuisances. Fortunately, the powers of the new corporation enable them to compel the removal or abatement of the whole. The great purification has thus at last been commenced; and although its progress as yet has neither been creditable to the energy of the corporation, honourable to the proprietors of those lots, nor beneficial to the public health, there is great reason to hope for relief at no remote period. When this salutary object is accomplished, our public sources of disease will be so few and inefficient, that we may, without hesitation, expect to see Cincinnati approximating in healthiness, the driest and most elevated situations, remote from the river.

SECTION 3. Mineral Springs.

The western country is abundantly supplied with *salines*, or salt springs. The richest and most copious are on the bank of Great Kenhawa, in the western part of Virginia. Along with the common salt, *muriate of soda*, there is a large portion of the *muriate of lime*, as I have found by examining the *bittern* or *mother water*, which seems to consist entirely of that salt.

In various parts of Kentucky, salt springs were long since discovered, and are frequented by invalids. Several of them contain the *sulphates of soda*, or *magnesia*, and a few afford *sulphurated hydrogen gas*. In the Indiana and Illinois territories, and in this state, near the Auglaize and Sciota rivers, springs of a similar kind are known to exist. *Chalybeate* waters, consisting generally of *oxide of iron*, dissolved by the agency of *carbonic acid*, are almost as numerous. On the present occasion, we must confine ourselves to those which are situated within such a distance from Cincinnati as to be accessible to its valetudinarians.

In the bed of Licking, within a mile of its mouth, when the river is low, several copious veins of *chalybeate* water burst out, and have occasionally been resorted to by our citizens. In addition to the *carbonate of iron*, they contain the different salts common in the spring water of this region. They seem to be formed in the alluvial grounds which skirt the river, and may be mentioned as specimens of a numerous class of *chalybeate* springs, with which the alluvial formation abounds. The majority of them, however, are less copious than those under consideration.

About two miles above the town, on the declivity of the hill, a well has been dug in the loose clay and lime stone, which have formerly been precipitated by the undermining action of the current. The water of this well is moderately charged with *sulphurated hydrogen gas*, common salt, epsom or glauber salt and iron, with some useless ingredients. Its effect on the system is that of a cathartic; and from its *chalybeate* properties in addition, it will unquestionably be found a valuable water. The proprietor intends, by the ensuing summer, to make it a *watering place*; for which its topographical situation is highly agreeable. The road leading to it from Cincinnati, lies along the river bank, and its site is healthy, well ventilated, cool, and commands a view of the valleys of Licking and the Little Miami, which are seven miles asunder. In the vicinity of Northbend, marked *Cleves* on the map of the Miami country, there is a spring of a similar kind; but it is less highly charged with saline matter, and is without sulphur.

The most noted watering place in the Miami country, is the Yellow Spring, in Green county, 64 miles from Cincin-

nati, and two from the falls of the Little Miami. It is a copious vein which bursts from a fissure in the silicious lime stone rock; and is, at the distance of a few rods, precipitated into a ravine more than a hundred feet deep. On its passage thither, it has deposited an immense bank of brownish ochre, blended with leaves, twigs and other vegetable matter. The brook which flows along this wild and narrow valley, falls over many successive ledges, which adds much to the interest of the scene. Its margin is fringed with a variety of beautiful shrubs, whose broad and heavy foliage affords an agreeable contrast with the slender leaved cedars that adorn the rocks above. A quarter of a mile below the spring, this brook is joined by another, flowing in a similar valley. Along this, a number of excavations have been unsuccessfully made, in search of ores. Among these there is one, five or six feet deep and as many in diameter, which was dug at a period altogether antecedent to the settlement of this country by the Anglo-Americans; but whether by the French or the ancient inhabitants, is quite uncertain. The valley of these united streams exhibits to the geologist the transition from the common to the silicious lime stone strata—and a visit to the falls of the Little Miami will afford several charming prospects. Upon the whole, a tour to the Yellow Spring will amply repay the traveller, if not the invalid; and amuse those who are in health, if it do not in many cases heal the infirm. As to the fountain, it is transparent, emits no air bubbles, and has the temperature of 52 degrees; which is that of the springs in its vicinity. Its taste is that of a slight chalybeate, and the examinations which have been made, indicate it to contain a portion of oxide of iron and carbonate of lime, dissolved by the agency of carbonic acid gas. In its other saline impregnations, it appears to have no excess over the springs of the Miami country generally; it is used for domestic purposes, and its sensible effects on the human system appear to be inconsiderable. In those cases of chronic disease and debility, where a chalybeate is proper, it has however been used with advantage.

An attempt has been made to prepare a paint from the deposit below the spring, which has been attended with the most flattering success.

The springs most resorted to by the people of Cincinnati,

are the *salines* at Big Bone, 22 miles south-west of the town, in the state of Kentucky. They are several in number, and their waters were formerly employed in the manufacture of salt; until the discovery of stronger *salines* on the Great Kenhawa, reduced the price of that article below what it could be afforded when manufactured at these *licks*. The waters at Big Bone hold in solution, besides common salt, the *muriate of lime*, *sulphate of soda* or *magnesia*, and a few other salts of less activity, but no iron. They afford a great quantity of *sulphurated hydrogen gas*, which is constantly escaping in bubbles. From their effects on the sulphates of copper and iron, they appear obviously to contain a portion of *gallic acid*, that is no doubt furnished by the vegetable matter through which the waters rise. The springs are situated near the termination of the back water of the Ohio, and consequently at a point where great quantities of twigs and leaves (most of which from the nature of the surrounding forest must be of oak) are brought down by the current, and deposited. The temperature of the springs is 57 degrees. Their taste and smell are sulphurous, and offensive to strangers; but the impression made by the gas is transient, and the taste of the common salt afterwards predominates. They do not increase the pulse, but their sensible effects on the alimentary system, kidneys and skin, are great. The action of the two former are very much increased; and the latter is frequently affected in a few days with a violent itching, and an eruption of pimples or pustules, which are now and then connected with large *boils*. These waters are, however, neither serviceable nor safe to persons whose constitutions have been long and generally debilitated; whose digestion is bad, from permanent weakness of the stomach; who are affected with head ach, and a general reduction in the energy of the nervous system; or who labour under that species of pulmonary consumption which will not bear depletion. The disorders to which they seem peculiarly adapted, are the torpor, obstruction or chronic inflammation produced by acute diseases in the lungs, liver, spleen, kidneys; in short, any of the viscera; and which have not continued so long that the constitution is exhausted. In these cases, experience has shown them to possess all the efficacy which could be expected in any mineral water. From a pint to a gallon, may be taken daily, accord-

ing to the strength of the patient, and its sensible effects on the system. The quantity drunk at first, should be small, especially by those of a reduced habit.

The valley in which these springs are situated, is of moderate width, and bounded by a waving and irregular rampart of elevated hills. The scenery is romantic, and not destitute of picturesque features; but the verdure in spring and summer is rather unvaried, and the enchantment of a distant perspective is wanting. These defects in the configuration of the vale are, however, amply compensated by the mighty relics which it entombs. It is now more than half a century since these first attracted the attention of European travellers; and so many have been borne off, that a few fragments only remain on the surface, to excite the associations and recollections which this consecrated spot is calculated to inspire. As no other place hitherto discovered in the Union has afforded such quantities of huge animal remains, and as the first ever transmitted to the philosophers of Europe, were collected here, the Big Bone valley deserves, among naturalists, a classical distinction. It is indeed well worthy a visit from those who can relish the sentiments and the speculations excited by contemplating the ruins of the largest animal species which have appeared on our globe. And if, according to Mr. Jefferson, the passage of the Potomac through the Blue Ridge, be a scene worth a voyage across the Atlantic—the tomb of the mammoths will certainly reward the traveller of taste and science, for a journey from Cincinnati.

An establishment for the preparation of *artificial mineral waters*, was made in the spring of the present year; and during the few weeks that it continued in operation, it attracted much attention. The proprietor has made arrangements for opening a greater number of fountains the ensuing summer; and will be able, hereafter, to supply the citizens of Cincinnati with as fine a variety of these salutary waters, as any of the large cities can afford.

On the Relation subsisting between the Time of the Day, and various Functions of the Human Body; and on the Manner in which the Pulsations of the Heart and Arteries are affected by Muscular exertion. By ROBERT KNOX, M. D. Edinburgh.*

To the Editor of the Edinburgh Medical and Surgical Journal.

SIR,

I HAVE ventured to submit to you for your approbation some observations and experiments on a subject, which, for some time, has occupied a considerable share of my attention. The matter itself will perhaps at first sight, appear to many rather curious, than interesting or useful. But it ought to be remembered that observations, in themselves apparently of little direct importance, have, in the progress of time, been found much to benefit science.

I may here briefly mention the circumstances which first induced me to investigate opinions, to the correctness of which so many had unlimitedly subscribed. Annoyed like others with the interminable disputes concerning the *stimulant* and *sedative* powers of foxglove, I resolved to make a few experiments on that celebrated drug. A variety of perplexing circumstances soon convinced me of the necessity there was, correctly to ascertain the various conditions of the healthy pulse, particularly as regarding muscular exertions, diet, &c. This knowledge, however, I found was not to be attained in a short time, nor without considerable labour. Contrary to my expectations, that which I deemed of minor importance, or merely preparatory to other researches, became a valuable subject of inquiry.

Whilst conducting the experiments about to be related, I have often almost despaired of reducing to general laws the endless variety which the functions of the animal economy present to every observer. But remarking, amidst this seemingly inextricable confusion, a certain degree of regularity, I was induced and encouraged to prosecute the inquiry, convinced that we ought never to disregard those signs of order which nature manifests, whether they regard animate or inanimate beings.

* From the Edinburgh Medical and Surgical Journal, for January and April, 1815.

It is almost needless for me to observe, that every precaution has been taken to avoid error. If, throughout the essay, this desirable object be attained, it is principally attributable to the assistance of my friend Dr. James Thomson, continued with unremitting zeal and friendship, during a course of experiments both tedious and delicate.*

SECTION I.

1st, When we recollect that it is during the course of the day that all those circumstances, which tend to accelerate the pulse, are generally combined and present, the proposition that the morning pulse of a person enjoying health is quicker than the evening one, must seem almost a paradox; at all events so hostile to what appears probable or plausible, that the clearest evidence of its truth must be brought forward before we could expect to gain a single proselyte.

In detailing the results of my observations and experiments on this subject, a certain degree of license is necessarily made use of, which, however, does not at all affect the conclusions I have drawn. In these experiments it is not proposed to submit the functions of the body to rigorous calculation. In physiology, as well as in medicine, a near approximation to the truth is the only rational end we can possibly propose. Numbers are used, both because they render our ideas more precise, and cause to be distinctly perceived the limits to which we should wish to extend these doctrines. The variation in different individuals must necessarily be immense;—for that the candid will make proper allowance.

Dr. Cullen, (whose name is not merely celebrated, but venerated in medical science,) talked of a natural acceleration of the pulse, which, according to him, happens twice a-day, and resembles, in a distant manner, a febrile paroxysm. Now, amidst many hundred experiments, performed under a great variety of circumstances, I could never perceive any such phe-

* The subject of the experiments is about 22 years of age, of a moderate height, and somewhat muscular; his constitution may be called irritable,—by which is meant only, that it is easily excited by stimulants of almost every kind. He has not laboured under any serious disposition for a great number of years, nor is he conscious of any hereditary or acquired tendency to disease in any organ.

nomenon. The time of the day at which the first spontaneous acceleration is supposed to happen, is noon. My own pulse never shewed any symptoms of such acceleration, but, on the contrary, always diminished in velocity. Thus,

Ex.	11, A. M.	Pulse 72
	12, noon,	71
	1, P. M.	65
	Half past 1, P. M.	64

The other paroxysm, according to the same author, occurs in the afternoon, and that, too, totally independent of any excitement by food, &c. This opinion is equally erroneous with the former.

Ex.	3, P. M.	Pulse 68
	4,	66
	5,	64
	6,	62

Ex. Half past 3, P. M.	Pulse 67	Half past 6,	Pulse 62
Half past 4, P. M.	67	7, P. M.	62
5, P. M.	64	Half past 7,	60
Half past 5,	63	8, P. M.	58
6, P. M.	63		

These experiments are in direct opposition to the statements of Cullen; yet, whoever carefully peruses that author's works, more anxious to discover truth, than, by partial views and misrepresentations, to detect contradictions, will be convinced that Cullen's notions are partly just, and partly erroneous;—that delicate and accurate observation is blended throughout with supposition, assertion, and hypothesis.

2d, This quickness of the arterial pulsation, observable in the morning, is at present very generally disbelieved; yet nothing can be more easy than to ascertain the fact experimentally. Perhaps the following instances, taken at random from a great number of others, may go far to settle the point. In the following table the pulse was reckoned in the sitting posture, (this is always to be understood, unless the contrary be expressed) before breakfast, and a short time after rising from bed; and, in the evening, after a light supper, and generally

some spirituous liquor, taken, however, in small quantity, and much diluted. The power of alcohol in raising the pulse is well known. The period is the summer time.

TABLE.

About 9, A. M.

68	68
65	74
68	70
68	69
67	65
62	70
70	71
70	68
64	76

The average result of these
is 68.5.

About 12, P. M

63	63
70	70
62	66
61	62
59	63
63	72
62	72
61	72
66	62

The average is 64.38.

To render the result of this table the more striking, it is necessary for me to point out a few circumstances, to which considerable attention ought to be paid. In the morning, the pulse was reckoned immediately almost on rising from bed, and always before food of any kind was taken. Every circumstance, therefore, conspired to reduce the pulse. On the other hand, the evening pulse was reckoned after the many exertions undergone during a long day,—after exercise of mind and body,—after food and drink; the pulse is, notwithstanding, considerably less frequent than in the morning, when every thing favourable to the rapid state of the circulation was carefully guarded against. But the pulse is not only in general quicker in the morning than in the evening; it is also more excitable; i. e. the same quantity of food or drink, the same degree of exercise, shall be found to exalt the pulse more in the morning than at any other period of the day or night; and the capability of being excited may, generally speaking, be said to diminish from a very early hour until the same hour next morning. The *data* on which this assertion rests are pretty numerous, though not so complete as I could have wished them to be. To accomplish this, would have required a complete change of my mode of life, which I found at the time impracticable.

TABLE

Showing the different states of the pulse, as reckoned at three different periods of the day, viz. after breakfast, dinner, and supper. The experiment was made during summer.

After breakfast, always before 10, A. M.	After dinner, before 5, P. M.	Evening, between 10 and 12, P. M. generally near 12.
Pulse 66	Pulse 68	Pulse 63
68	71	70
69	73	62
66	69	61
69	71	59
69	74	62
70	76	65
64	66	63
80	80	68
73	80	70
75	76	76
80	76	68
74	84	60
74	72	63
78	72	59
75	72	62
76	80	66
73	76	62
Average 72.	Average 74.22, &c.	Average 64.388, &c.

The conclusions to be drawn from this table are obvious. To render them still more so, I may observe, that the breakfast is generally a moderate one, consisting of coffee, bread, and eggs; the dinner always of animal food principally, and a small quantity of vegetables; to which was often added a little spirits or porter; and, notwithstanding the vast difference between the stimulating powers of these two meals, the morning pulse is inferior to the one after dinner by only two beats; the difference would have been ten or fifteen, had the case been reversed, at least I am induced to think so from some experiments which I afterwards instituted directly to ascertain the point. In the evening the pulse was reckoned after supper, light, indeed, but certainly equal to the breakfast in stimulant power, and in some measure more so, because spirituous liquors

very generally supplied the place of coffee. Notwithstanding this, the evening pulse is found to be, on an average, nearly eight beats lower than the morning one; a difference by no means inconsiderable, and sufficiently warranting the conclusions I have drawn from it.

The following table was drawn up, in order to ascertain the effects which moderate exercise in the morning would produce on the pulse, reckoned, however, in such a manner as not to be immediately affected by it.

TABLE.

A walk of three miles before breakfast. Pulse after breakfast.	Pulse after dinner, as usual.	Pulse after supper, as usual.
74	76	62
81	78	62
80	75	62
83	78	64
80	75	66
78	74	64
Average 79.33.	Average 76.	Average 63.3, &c.

3. My experiments have not yet enabled me to ascertain, with precision, the hour when the pulse begins not only to be actually more rapid, but also to acquire a greater capability for action, manifested by the exhibition of any stimulant. This, with myself, perhaps takes place about 3 P. M. (A. M.); but there is every reason to believe that the time varies with the individual, the season, climate; and perhaps, though this for many reasons is improbable, with the mode of life.

4. This increased capability for action, occurring regularly in the morning, is even of greater importance than the *actual state* of the circulation; the former may be made the subject of very delicate experiments; the latter we know to be exposed to a thousand variations, from causes which have been in part developed. While experimenting on this subject, there occurred to me a case, altogether of so interesting a nature, that I cannot refrain from giving it in detail. It affords a remarkable proof of the truth of the doctrines brought forward in this essay; at the same time, independent of this consideration, from the rarity of its occurrence, it appears to be worthy of record.

M. C. aged 4.—The account we received from the parents of this child was, that she continued in good health until about six months after birth, when a blueness of the surface was remarked, particularly on any exertion, and accompanied with perpetual difficulty of breathing. In this state she continued to grow, and became remarkably tall of her age. She was observed, however, to get daily worse; that is, the paroxysms of threatened suffocation became more frequent, during which the whole surface of her body appeared almost black. A strong beating was constantly to be felt in the region of the heart, and she was sometimes convulsed; muscular debility great. At her death she measured three feet four inches. The body continued warm for five hours after death.

Dissection.

1. *External appearances.* The countenance, feet, and body, were not all discoloured; the arms and fingers retained their usual dark colour.

2. *Thorax.* The lungs seemed sound, though dark-coloured; heart perhaps larger than usual; *foramen ovale* pervious, and pretty large. The *aorta* arose from both ventricles in such a manner, that the ventricles communicated with each other, and with the cavity of the vessel, which was much enlarged; its *vasa vasorum* distended with red blood. From the right ventricle there arose a pulmonary artery, very small in its diameter, (perhaps the size of a small goose quill) and feeble in its coats; it possessed all the characters of the artery, such as its valves and division into two branches. Not the smallest vestige of a *ductus arteriosus*; it seemed never to have existed. The passage from the left ventricle into the artery, common to both, was more direct than that from the right. Every where the arteries were full of dark blood, not coagulated.

3. The abdominal viscera were of a very dark colour. The head was not examined.

Before leaving the house, the father of the child related to us a circumstance to which we all paid particular attention. The child, he informed us, had always been very fretful and peevish, (perhaps from indulgence,) and apt to have frightful paroxysms when spoken to harshly; but these happened much more fre-

quently in the morning; indeed he observed that she was always ill in the early part of the day; so much so, that the smallest exertion, an angry word, or even a cup of tea, would instantly bring on a paroxysm, each time threatening destruction. This tendency to these fits decreased from morning, till about 5, P. M. from which time she generally continued well till bedtime. The father detailed this with great minuteness, and seemed to wish for an explanation.

It will be easy to anticipate to what cause I would ascribe this increase of disorder in the circulation, during the forenoon. So disproportionate was the pulmonary artery to the aorta, it was with difficulty that life could be carried on; but, in the morning, when the susceptibility of the arterial system was greater, the inequality must also have been increased to such a degree as almost to have destroyed life. I may also remark that she died about 9, A. M.

5. To be convinced that an opinion, very different from that now brought forward, is the one more generally received, we have only to turn to the writings of a few celebrated physiologists. Thus, for example, in the "*Physiologie Positive*" of Fodéré, a work of merit, we find the following remarkable passage: "*Relativement à la différence du jour et de la nuit, on remarque que le pouls de l'homme adulte bat de 60 à 65 fois par minute, au commencement du jour, et qu'il va continuellement en augmentant jusqu'à battre 80 fois dans le même temps, chez les plus excitables, sur la fin de la journée; dans la nuit, les pulsations diminuent de nouveau, jusqu'au matin, où elles se trouvent revenues insensiblement au nombre de 60 à 65.*"* In order to have an approximation to the truth, we have only to reverse the above statement. If we regard as accidental circumstances the accelerations of the pulse, occasioned at various times by our diet, and that, too, according to the caprice of the individual, the pulse shall be found gradually to diminish in velocity from an early hour until midnight, and generally later. This difference I have found to be great in winter, but less, though still existing, in summer; as the above experiments, performed during that period, sufficiently prove; and from this I am inclined to believe, that heat has no inconsiderable share in

* *Essai de Physiologie Positive*, Tom. I. p. 190.

the production of the phenomenon, though totally inadequate solely to produce it. This gradual excitation in the number of the pulsations Fodéré conceives to be owing to the combined effects of exercise, of the action of the internal and external senses, of light, heat, purer air, &c. Violent exercise towards evening will certainly produce a considerable excitation of the pulse, but less than what takes place in the morning, in consequence of the same degree of exercise; neither will any degree of heat, nor quantity of food, raise the pulse in the evening to the height at which it is in the morning, almost without any such excitants, provided they be not used in an immoderate degree.* Thus, after fasting till 8 P. M. I found my pulse to be 58; at 9 P. M. after eating a moderate dinner, pulse 58.

The common mode of experimenting with unequal quantities of food, taken at various hours of the day and night, was evidently insufficient to establish the principle in its full extent. I endeavoured, accordingly, to submit to a particular regimen, and examine the state of the pulse under the influence of a diet always similar at every hour of the day. This decisive experiment could not be pushed any length; so difficult a matter did I find it to break through, at once, those habits which a great number of years had firmly established.

6. "All these things (continues Fodéré) singularly facilitate the return of the venous blood towards the heart; and this is one of the causes of the evening paroxysm which takes place in all fevers." But, having denied that any such gradual increase of the pulse exists, we need scarcely stop to say, that this cannot be one of the causes of the evening paroxysms in fever.

This opinion appears to be borrowed from the celebrated Cullen. That author, however, increased the facility of explanation, by describing two exacerbations or augmentations of the pulse; one about mid-day, the other towards evening. This explains, in his opinion, the occurrence of the double paroxysm in hectic fever.† The whole is a pure *hypothesis*, which seems partly to have arisen from supposing that the pulse was governed by the same laws in health and disease. So far as my observa-

* In experimenting on this point, care must be taken that the acceleration of the pulse, occasioned by indigestion, be not confounded with the natural healthy pulse, produced by the simple stimulation of the food.

† First Lines of the Practice of Physic, Vol. I. c. 862.

tions go, the order of nature in disease is entirely reversed, and the observations of Cullen, Fodéré, and others, are applicable only to the unhealthy. That this acceleration of the pulse (which is really an aberration from the regular laws of nature) actually happens in fever, the testimony of Cullen, generally so accurate in the observance of disease, will sufficiently establish; and that this universally takes place in phthisis, we have, unfortunately, too many opportunities to verify.* It was from the sinking of the pulse towards evening that I ventured, independent of other circumstances, to prognosticate favourably in the case of a child labouring under typhus fever. It was this which induced me to hope that some of the functions had begun to resume their natural order, and that recovery was a probable event. Nor was I deceived; by proper attention the patient from that day rapidly amended.

7. The physiologists who invented the various diurnal accelerations of the pulse, one, two, or more, just as suited their fancy or necessity, will perhaps find little difficulty in explaining the gradual diminution of the pulse, should the phenomenon appear to them to be correctly stated. With me, I confess, the cause is yet excessively obscure, because I have not found it connected with any circumstance, to the influence of which I might ascribe it. Experiment showed me that no previous exhaustion from labour, excess in food, drink, &c. rendered the diurnal diminution of the pulsations more evident than usual; the want of food, perhaps, hastens and increases it, but certainly does not prevent or retard it. Neither is sleep the cause of the restoration of the susceptibilities and velocity of the morning pulse, since the negation of that does not at all destroy the *excitability*† of the sanguiferous system, as manifested by the application of the accustomed stimulants.

August 30th, 1813, the day being moderately warm, I walked, between 1 and 11 P. M. a distance of nearly 40 miles. Not having much appetite, retired to rest about 1 A. M. after drinking a little coffee, but slept none, perhaps owing to over-fatigue. Next morning (31st) about 7, my pulse was 80 and rather feeble; after breakfast, before which I took a small glassfull of

* Beddoes' Essay on Consumption, p. 252.

† I use this word merely to avoid circumlocution.

spirits, my pulse rose to 104. I was not feverish, and performed a journey that day of 27 miles, at a tolerable pace.

To what, then, are we to attribute this daily diminution of velocity in the functions of the sanguiferous system? Its existence as a law of the sanguiferous system, has been demonstrated experimentally; and I shall endeavour to show, that a similar revolution daily takes place in several other functions of the human frame. To this conclusion Dr. Cullen arrived, merely from observing the daily returns of sleep and watching, of appetites and excretions, and the changes which regularly occur in the state of the pulse. Of these changes he had, however, no clear ideas. When he proceeds to combine this diurnal revolution with the phenomena of fever, he unquestionably offers a conjecture, extremely probable, ingenious, and perhaps original; but unfortunately, there results from this fine idea nothing but conjecture and hypothesis, attributable principally to an incorrectness in the observance of the phenomena.

8. It required few experiments to convince me, that animal food raised the pulse much more than vegetable; the excitation of the pulse by wine is still greater, and that from spirituous liquors greatest of all. By these circumstances, but more especially by diet, the regularity in the diurnal revolution in the pulse, is, as might have been anticipated, much disturbed. But it was impossible to perform these experiments without remarking, that something similar happened to various other functions. Thus, beyond all doubt, our perceptions in the early part of the day are clearer, our minds more acute, our whole intelligence more active. The functions of the stomach seem also much stronger at this time than towards the evening. Feverish, restless nights, are the invariable attendants on late meals, which injure in the *ratio* of their quantity.

I have repeatedly remarked, that digestion went on more easily in the morning than in the evening. Three or four times have I been induced (sometimes compelled), whilst following some favourite sport in the country, to defer the taking food until evening; a greater or less degree of fever and restlessness, in proportion to the quantity of food taken, has uniformly followed such indulgence.

It was long with me a problem difficult of solution, why digestion should go on laboriously during the evening, when the

actions of the muscular system were almost entirely suspended; more especially when I recollected, that the opinions of most, perhaps of all physiologists, led us to conclude, that rest greatly favoured the digestion of our food. The objection, that during sleep, in which state the repose of the body is complete, digestion, nevertheless, is generally ill performed, seemed at first insurmountable; and it is not a little remarkable, that those physiologists who have so repeatedly stated the fact, have as constantly failed to note the objection. On observing that practical men expressly stated the necessity of rest for the right performance of the function of digestion, and experiencing daily the truth of the observation, I was convinced that the above objection was rather inexplicable than hostile to the opinions of physiologists, which I then, and still do consider as strictly correct. But this phenomenon is no longer difficult of explanation, if a daily revolution in the functions of the stomach be demonstrated by experiments, or even rendered probable by analogy.

On this subject, the opinion of those, whose profession it is to train men to the performance of great muscular feats, when they speak the truth, is of much more consequence than that of any medical man. Experience has taught them that the evening is not a proper time for the digestion of the food; and accordingly we never find any substantial meal taken by their pupils after 5 P. M.; indeed they lay it down as a rule, that on going to bed, the stomach should have as little to do as possible. Thus it is recommended* to sup about 9 o'clock on a chicken, or some food that is nourishing, not gross. In another place,† you must retire early to rest, on a supper of runnet-milk, or milk-pottage. Again‡, two meals a-day, viz. at 8 A. M. and 5 P. M. But these hours are rather later than the ones laid down by Jackson, who says,§ “they breakfast upon meat about 8 o'clock, and dine at 2. Suppers are not recommended, but they may take a biscuit and a little cold water about 8 o'clock (I never heard of a more moderate supper) two hours before they go to bed.”

* Sinclair's Code of Health, Vol. II. p. 163.

† Ibid p. 112.

‡ Ibid p. 104.

§ Ibid p. 94.

The object kept in view during the training, is to enable the human frame to acquire the utmost degree of vigour consistent with health. To accomplish this, they employ the organs at the time when they ought to be employed, that is, during the early part of the day. "The exercise is always begun early in the morning, in summer at five; in winter at half-past six, or as soon as it is light. We prefer rising early in the morning, indeed it is indispensable."

Strictly speaking, this increase in the functions of the body, may be more properly called an augmentation and diurnal revolution in the functions of the nervous system. But this is too indefinite a term; no two individuals attaching precisely the same meaning to it; and we shall therefore consider the above facts, brought forward by Mr. Jackson, as proofs of an increase in the powers of the muscular system, without offering any conjecture on what that peculiarly depends; whether it be connected with increased energy of the brain, or be totally independent of it.

I shall close this part with a single additional observation. It is this: The regular decrease in the powers of the stomach is not dependent on any previous exertion of that organ, for I have found that a dinner taken at a late hour, with or without previous exhaustion, was always digested painfully and laboriously, with feverish nights, distressing dreams, and, instead of refreshment, further exhaustion. This arises not from the food stimulating at that time the system more powerfully than in the morning. If we may judge from the pulse, it stimulates the body much less at midnight than at nine in the morning; but it arises from this, that the powers of the stomach are more languid; it does not digest the food taken into it; and should a feverish night follow, it is neither wonderful nor inexplicable. Hence we see the propriety of no function being much employed during the evening; not because it will greatly excite the pulse, and so produce fever (ridiculous idea! the excitation of the pulse does not produce or constitute fever); on the contrary, the stimulation is actually less, it is almost as nothing, so far as regards the pulse; but the phenomenon is occasioned by this, that all the organs are less powerful, less capable of exertion; in short less able to perform their functions, or undergo fatigue. A remark made by Cullen also illustrates in

some degree the doctrine I have brought forward. "It is indeed to be observed, that in almost every person the taking of food occasions some degree of fever; but I am persuaded this would not appear so considerable in a hectic, were it not that an exacerbation of fever is present from another cause; and accordingly the taking of food in the morning has hardly any sensible effect." Here we see what so seldom happens, all the facts throwing light on the doctrine, and it on them; for although the morning be the time when the action of food over the pulse is greatest, yet is there no febrile state excited. On the contrary, in the evening, as Cullen has remarked, a febrile paroxysm occurs in hectic, independent of food, aggravated perhaps by its presence, but whose real cause has totally escaped him.

9. Nor does this law seem confined to the functions of the brain, stomach, muscular, and arterial systems,—it extends, if I mistake not, to that of the lungs. Dr. Prout found, "that the quantity of carbonic acid gas, formed during respiration, is not uniformly the same during the twenty-four hours, but is always greater at one and the same part of the day than at any other, that is to say, its *maximum* occurs between 10, A. M. and 2, P. M., or generally between 11, A. M. and 1, P. M.; and its *minimum* commences about half past 8, P. M., and continues nearly uniform till about half past 3, A. M."* The same gentleman observes, that the quantity of carbonic acid given off during respiration, bears no proportion to the numerical state of the pulse; in fact, he imagines that most carbonic acid is given out when the pulse is least frequent. My own experiments undoubtedly disprove this idea. The greatest quantity of acid, according to Dr. Prout, was given off during the forenoon, when the pulse is, in general, higher, and always more easily excited by any exertion; we may almost say, that the capabilities of the arterial system are at that time greater; and the importance of this remark, as it regards *secretions*, must be obvious. Besides, from what I can judge of the tables given by Dr. Prout, they refer principally to the afternoon and evening, unless some of the tables be wrong marked. Notwithstanding this, I am much inclined to agree with him in this, that the quantity of carbonic acid given off during respiration is not

* Annals of Philosophy, Vol. II. p. 330.

particularly connected with, at all events, not dependent on, the state of the circulation. His experiments on the state of the respiratory organs after exercise—after the taking of spirituous liquors—during a mercurial course;*—in short, after every thing which could excite the circulation, show this in a decided manner. These experiments, however, require repetition. Many of them are too scanty to enable us to draw any certain conclusion from them, whilst others are contrary to all analogy.

The opinions contained in the excellent essay of Dr. Prout do not seem to invalidate the conclusions which I have ventured to draw from my experiments: they amount to this—that all the functions, or at least many of them, are more vigorous in the morning than in the evening; that their capability for action is certainly greater; and that this increase in the functions commences at a much earlier hour than is generally imagined.

Were it lawful for me to speculate, in this experimental age, I would venture to support an opinion, at present, I allow, something antiquated, and very *unfashionable*, that early rising may be conducive to long life, as it most certainly is to the perfect enjoyment of all our faculties. It was from repeated violations of all these dietetic maxims that I first perceived their importance; perhaps by a similar experience alone can others be convinced of their value.

Before concluding this section, it is my duty to observe, that, on mentioning the results of some of these experiments to a medical friend, he assured me that experiments, performed by him about ten years ago, led to conclusions which were, in his opinion, extremely similar to mine. This circumstance, he observed, was very satisfactory to him, as my experiments had been performed, and my conclusions drawn, without any communication of ideas: it will be equally so to me, if I find the results exactly to correspond;—results of experiments performed by individuals so opposite in habits, temperament, and opinions.

SECTION II.

In this section, we propose considering the effects of muscular motion on the pulsations of the heart and arteries. In what

* Dissertatio de Copia Acidi Carbonici, &c. Andrea Fyfe auctore, Edin. 1814.

manner these pulsations are augmented in number, vigour, fulness, &c. by exercise, or, to speak more generally and correctly, by muscular motion, it is perhaps impossible, in the present state of our knowledge, to say. It seems however probable, that farther research may shortly lead to notions more precise than the ones we at present possess. Our concern is with the fact itself; *viz.* that, by muscular action, the pulsations of the heart and arteries are augmented in power, velocity, &c. This fact, apparently so unproductive, and, by reason of its perpetual occurrence, so little apt to excite attention, shall yet, on examination, be found to throw some light on the physiology of the human body, and may perhaps assist in exonerating it from a charge so lavishly and inconsiderately bestowed,—that it is a science destitute of fixed principles; or at least, that a knowledge of the laws by which the animal economy is regulated, is, in a great measure, placed beyond the sphere of human intellect.

At all times it must have been observed, that muscular exertion, almost of any kind, but more especially violent exercise, increased greatly the powers of the heart and arterial system; but that this extended even to the slightest muscular motion, such, for example, as is made use of during a change of posture, does not appear to have been suspected, or if so, its importance has been greatly overlooked. We may reduce the section to the following heads:

1^{mo}, The most powerful stimulant which can be applied, in order to increase the action of the heart, is exercise. Walking at the rate of four miles an hour, requires at least a pulse equal to 132 *per* minute; and the time of the day, and the continuance of the exertion, less affect the rate of pulsation than one would *a priori* imagine. When I say, that walking at such a rate requires a certain increase in the arterial pulsations, I do not mean to assert, that an equal increase must necessarily occur in every individual. These numbers are added only to render the subject more definite; in short, as a single example,—as a proof that the increase is great, even in the strong and healthy. We shall immediately see how very differently the debilitated are affected. This high excitement is not followed by proportional exhaustion, in so far as regards the arterial system; a fact singular enough, since it is at variance with cer-

tain laws of the economy, supposed to rest on a secure foundation. Other organs certainly follow a different mode, and exhibit, after any increase in their functions, signs of exhaustion or weakened energy. Such a law seems to hold with regard to the nervous system, in particular with the digestive organs and the respiratory.*

2do, No stimulant which I have hitherto tried, has excited the pulse so much even as moderate exercise.

3tio, Various observations have rendered it probable, that the increase in the number of the arterial pulsations accompanying muscular motion, is greatly influenced by the debility or weakness of the individual. Were it allowable to apply the rigorous language of calculation to a science which cannot be called *exact*, we would say that such increase is in the direct *ratio* of that debility. Hence, in fever, the slightest change of posture shall often produce an incredible velocity of pulse. Persons who have suffered much from loss of blood, or by chronic complaints, cannot bear the erect posture for any length of time; and hence, in the debilitated, who, it is well known, are very subject to faintings, the slightest muscular motion by inducing or necessitating a rapid motion of the blood (in them too rapid,) shall give rise to that distressing accident.

As exercise increases, so other stimulants diminish the frequency of the pulse in the debilitated, at least generally. But as there may be various kinds of *debility*, in each of which the pulse may be differently affected by exercise, and as this increase of the pulse, when it does take place, is often accompanied with irregularity, a very extensive series of experiments is required, before we can implicitly agree with the above rule. On this latter principle, even in its present state, we may explain, I think, satisfactorily, many of the supposed stimulant effects of foxglove, which drug debilitates, directly and greatly, most *systems* of the animal economy.

4to, The time of the day has a very considerable effect on the augmentation of the arterial pulsations by moderate exercise. As this relation has already been considered at some length, I shall here confine myself to the statement of a few general results. During the morning, the mere change of

* Annals of Philosophy for November 1813, p. 328.

posture from the horizontal to the erect, shall increase the pulse by about 15 or 20 beats. At mid-day, this increase shall be 10; and, in the evening, 4 or 6. The effects produced by the sitting posture, assumed after the horizontal, are not half so considerable as those occasioned by the erect posture. The above is the manner in which the arterial pulsations are affected by posture, at different periods of the day; and though the results here stated may be greatly magnified in some, and equally diminished in others, it may, I think, be laid down as a general rule, that similar laws constantly regulate the healthy pulse.

From the above observation, we readily perceive, of how little consequence the details of physicians are, regarding the diseased pulse. If the slightest change of posture can in an instant excite the pulse by 50 or 60 beats, how easily may the medical man deceive himself and others! how often, without a previous knowledge of these facts, may drugs seem to benefit the sick, when they are inert, or actually pernicious.

5to, The increase of the pulsations occasioned by change of posture, may shortly prove a valuable *asthenometer*. There are others, but they do not seem so certainly to indicate debility as the above. Some of them, indeed, are more calculated to detect disease than simple debility. These *asthenometers* are* the hot-bath, the cold-bath, or cold air, also the non-excitation of the pulse by stimulants, supposed to happen in those habituated to spirituous liquors. Some may allege, and perhaps with justice, that this shall be found to indicate rather a state of disease than debility. This condition of the arterial, or perhaps nervous system, which renders the pulse non-excitabile by stimulants, is supposed to arise from other causes besides the abuse of spirituous liquors. “Une† observation très remarquable que j’ai eu occasion de faire, c’est que, lorsque la sensibilité a été émoussée par une affection chronique, les opiacées finissent par n’avoir plus de prise sur l’économie animale.” I have seen one case which favoured somewhat the above opinion,—the case of a young man, who, without doubt, laboured

* Beddoes’s Hygeia.

† Nouveaux Elémens de Therapeut. et de Mat. Med. par Alibert, Tom. II. 506.

under hereditary predisposition to consumption. His pulse, on one occasion, I found to be not at all affected by a very great quantity of spirituous liquors. The opinion remains to be proved or refuted by additional observation. Indeed, as it is customary with those labouring under chronic complaints to resort to the use of narcotics, (this practice had not been adopted in the case just mentioned), it is not to be wondered at that this class of drugs should at last cease to produce their wonted effects.

Somewhat connected with this subject is the detection of commencing disease in the lungs, or pulmonic debility. This, according to Beddoes,* is indicated by a continued high pulse. "When consumption is advancing, it will be more frequent than natural, and, in general, much more frequent towards the close of day." The whole subject is novel, and deserves attention.

As my only wish in prosecuting these experiments has been to correct a few notions regarding the physiology of the human body, and to advance that estimable science, I shall feel gratified with an examination of my experiments, whether that lead to a refutation or to a confirmation of the opinions maintained throughout this essay.

Observations respecting the Natural Production of Saltpetre on the Walls of subterraneous and other Buildings. By JOHN KIDD, M. D. Professor of Chemistry at Oxford. Communicated by WILLIAM HYDE WOLLASTON, M.D. Sec. R.S.†

[From the Philosophical Magazine and Journal, for December, 1814.]

ALTHOUGH the following observations afford no positive evidence of the source of that saline efflorescence which is so frequently seen on the walls of subterraneous and other buildings, and which, as consisting principally if not entirely of common nitre, long since gave rise to the name‡ by which that salt is most commonly known; yet as tending to throw some

* Essay on Consumption, p. 252.

† From the Philosophical Transactions for 1814, part ii.

‡ Saltpetre (Sal Petræ)

light on a very obscure part of natural history, they will not, perhaps, be unacceptable to this honourable and learned society.

There can be no doubt that the production of saltpetre or nitre, in the situations above alluded to, had been observed long before there existed any general inducement to collect it from those sources; but after the invention and subsequent extensive employment of gunpowder, it became an object not only to search out every natural source of the principal ingredient of that important compound, but also to investigate the circumstances of its production; for the purpose either of accelerating the natural process, or of imitating it by artificial means.

The usual and almost exclusive occurrence of saltpetre on walls constructed of limestone, and in situations exposed to animal and vegetable effluvia, in all probability led to the empirical practice of heaping together the mortar and refuse of old buildings with putrescent animal and vegetable matter; from a mixture of which kind, after exposure for a sufficient length of time to the action of the air, a quantity of nitre may usually be obtained by lixiviation: but it would be a question of mere curiosity, on this occasion at least, to investigate the origin of the practice. The intention of the present paper is to state the result of a series of observations, made during the last year, on the connexion that exists between the natural production of nitre and the state of the atmosphere. In detailing these observations, it will be convenient to give previously a description of the laboratory of the Ashmole Museum, in which building they were principally made: nor shall I be afraid of being thought too minute in this description, or in any other part of the following detail, by those at least who know the precision that is requisite in every induction, which like the present rests on phenomena of an obscure and equivocal nature.

The Ashmole Museum, which was built by Sir C. Wren in the reign of Charles the Second, is an insulated building, constructed entirely of calcareous freestone, and consisting of three stories. The lowermost of these stories was originally designed for, and has constantly been used as, a chemical laboratory.

The pavement of the laboratory, on its eastern, northern, and western sides, is about nine feet below the level of the street in which the Museum stands; on its southern side it is on the same level with an area, about ten feet in breadth, which in part occupies the site of the ditch of the old town, and insulates a quadrangular projecting part of the whole building of the Museum. The laboratory itself is a single room sixty feet in length from east to west, and twenty-five in breadth; having an arched stone cieling, the centre of which is seventeen feet above the level of the pavement. The walls of this room, which are nearly three feet in thickness, are constructed of squared calcareous freestone, which I have reason to believe was dug from a quarry near Burford, and is technically called Windrush stone, from the river of the same name. There are four windows in the upper part of the north side of the laboratory, formed in the curve of the arched cieling; the dimensions of each of which are five feet by four and a half.

There is no window either on the eastern or western side of the laboratory.

On the south side there are two windows, one at each extremity, looking into the area above described; and these windows are placed at the usual distance from the ground, that is, about three feet; and all that part of the south side intermediate to these two windows separates the laboratory from the quadrangular projecting part of the whole building of the Museum already mentioned.

The saline efflorescence takes place most copiously on the north wall, and it occurs on various parts of it from nearly the level of the pavement to within three or four feet of the centre of the arched cieling. It takes place also, though not so abundantly, on the east and west walls; and also at the eastern and western extremity of the south wall; but it is worth noticing, that I have never seen it on that part of the south wall which is common to the laboratory and the attached projecting building of the Museum. It is true that there are chimneys in this wall connected with fires that are lighted daily; but this circumstance does not seem sufficient to account for the absence of the nitre, because its formation takes place in another part of the laboratory equally near a chimney, and in which, from

being inclosed, the temperature of the air is always considerably higher.

It is also worth noticing, that between the highest and lowest points of its appearance in every part of the building there are intercepted spaces entirely and always free from the least deposition.

I may here mention that the occasional formation of nitre is observable in many other buildings and parts of Oxford, besides the laboratory of the Ashmole Museum; as on the wall, called Long Wall, which bounds the park of Magdalene College to the west—on the exterior surface of the south wall of the Theatre—on the exterior surface of the three walls of the quadrangular projecting part of the Ashmole Museum—very abundantly on the inclined base of the windows of the Examination school, looking to the north—and also very abundantly on the west side of the wall, which separates the square of the schools from the arched way leading from thence to the Theatre and Convocation House.

It has been observed repeatedly, that the presence of lime is necessary to the natural production of saltpetre; and in all the foregoing instances the stone on which the saline efflorescence takes place is the common limestone of Oxfordshire. I have only once observed its formation on the surface of a brick wall: but in that instance the substance of those bricks on which the nitre appeared had crumbled away to some depth; and if this destruction of their texture be owing to the presence of an unusual proportion of lime in the clay of which they are made, (a supposition not improbable, since many parts of the stratum of clay from which the bricks in this neighbourhood are made do contain an unusual proportion of lime,) the reason of the exception in the case of this brick wall will correspond with the truth of the general observation above stated.

The following circumstance is particularly deserving of notice. A part of the north wall of the laboratory, on which saltpetre usually effloresced, having been covered with wainscot some months since, and the wainscot having been painted with common white paint, I was surprised after a time in observing an efflorescence on particular parts of the paint, similar to what might have been expected on the wall itself. Where this

efflorescence had taken place the paint was loosened from the wainscot, and might be readily peeled off in small flakes. The saline particles of which this efflorescence consisted I at first supposed to be nitrate of lead; but upon examination in various ways no trace of lead could be found in them, and they exhibited the principal characters of common nitre: they deflagrated, for instance, with charcoal, leaving a deliquescent alkaline residuum. Many weeks have elapsed since that saline efflorescence was brushed off, but I have not yet observed any renewal of it.

Though the production of saltpetre had been pointed out to me in the laboratory of the Ashmole Museum as long since as the year 1802, I was prevented by many circumstances from observing with any degree of regularity or precision the phenomena of this natural process previously to the commencement of last year; about which time having carefully brushed away the whole of the saline efflorescence from a part of the north wall situated below the level of the street, and very imperfectly exposed to the light, I was surprised by the fact of its quick re-appearance. It was brushed away at the end of January; but within three days it had again effloresced in sufficient quantity to present that appearance of hoar frost, or down, or mould, which is very characteristic of the manner in which naturally formed saltpetre is often accumulated; and which a person, utterly incapable of judging of the real nature of the substance, described at the time by the term "damp."

I was still more surprised, however, in observing after a few days, that the quantity of the saltpetre was apparently very much diminished; and that at the end of eight or ten days there was scarcely any appearance of it remaining: though there was no reason to suppose a particle had either accidentally fallen to the ground or been intentionally removed.

The same part of the wall was again brushed perfectly clean, and I continued to make daily observations in expectation of a renewal of the process; but no new collection was perceptible, excepting in the form of a very few detached and minute capillary crystals, till the 16th of March; on which day, having been absent during the whole of the 14th and 15th, I found a more abundant accumulation than in the preceding instances.

It was an obvious supposition that the reproduction of the

nitre was connected with some change in the state of the atmosphere: and it is to be remarked, that its first-mentioned appearance took place in frosty weather, and that its re-appearance about the 16th of March had been preceded by a frost of a few days: whereas during the intervals in which it disappeared and was not again produced, the weather had been mild. The wall was again brushed quite clean on the 16th of March; between which day and the 4th of April a considerable quantity had again collected on the same part; the process having been more rapid during the last four or five days, which were cold.

On April the 12th the front of this part of the wall was renewed by scraping, for the purpose of observing what would be the effect of a fresh surface, and before the 25th of April nitre had formed on many parts of this new surface; but having first increased and then continued stationary for some days, it began to diminish about the beginning of May, the state of the air having been very moist during the two or three preceding days.

About the middle of May 1813, I selected several distinct parts on which the spontaneous formation of nitre usually takes place, some within and some without the building of the Museum, and began to make daily observations on the phenomena of that process, which I noted down at the time: but as a register of this kind would be unnecessarily tedious in its recital, I shall beg leave to give the following general results of those observations; requesting it may be kept in mind, that I do not presume to lay a greater stress on them than is proportional to the short period of time and the circumscribed space in which they were made.

It appears then from the observations I have hitherto been able to make, that the spontaneous formation of saltpetre is, generally speaking, much more extensive and rapid in winter than in summer, whether it take place on the interior or exterior of a building: thus during the period of the cold weather in January 1814, it became visible not only on parts of the walls where I had never before observed it, but even on the pavement of the laboratory. The part of the pavement on which it appeared is adjacent to the north wall; but as the greater part of the pavement is covered by a flooring of wood, it is impossible to say whether or not it took place on other parts also. The

stone forming the pavement is the same kind of limestone as that of which the walls are built.

Again, whereas in summer its reproduction is most rapid and extensive in proportion to the degree of light present, the reverse of this (though not universally) takes place in winter. Wherever the saline efflorescence in question occurs, the surface of the stone becomes permanently discoloured, as if from the effect of damp; but this discoloration is merely superficial. If these discoloured parts be whitewashed, the process still goes on; and the whitewash is gradually detached in flakes: but it is difficult to ascertain whether the nitre is formed on the whitewash, or on the wall which it covers; though probably the latter.

When the spontaneous formation of nitre takes place slowly and in a sheltered situation, it is at first visible in the form of minute prismatic crystals, which usually project from the surface of the wall nearly at right angles; but sometimes they are scattered in different directions, lying upon its surface so lightly as scarcely to appear in contact with it. In general, however, the saline efflorescence makes its appearance in extremely minute capillary crystals, either accumulated in groups, which resemble recently fallen flakes of snow, or investing the wall like a fine down.

During the severely cold weather of January 1814, it appeared in some places in the form of minute dense grains closely aggregated; while in others it still continued to wear the appearance of down or wool: and the local circumstances most obviously connected with this difference in the manner of crystallization, were the presence of a greater degree of light, where the granular deposition took place, and a less degree of shelter from the influence of cold air.

In some instances the production of the saltpetre is accompanied with a disintegration of the substance of the stone on which it is formed; but this circumstance is only observable on stones of a loose texture.

The shortest interval I have observed between the time of its having been brushed away and its re-appearance, is four hours: but it was then in full efflorescence, and would probably have been visible much earlier. The observation was made

on November the 17th, about midnight: there had been snow in the middle of the day, and the night was frosty.

The spontaneous formation of nitre takes place indifferently on the surface of the stones composing a wall, and of the mortar by which those stones are cemented; and near the close of the late frost, I observed it for the first time on the surface of a partition consisting entirely of laths plastered over with the mortar or stucco commonly used for that purpose.

It accumulates in greater quantity on some parts of a given surface than on others; and this difference in the degree of its accumulation, is probably connected with some slight difference in the texture or composition of the stone on which it is formed: for I have repeatedly observed that after a careful removal of it, its reproduction takes place to the same proportional extent in the same parts: and this difference in the degree of the efflorescence often takes place not by a gradual transition, but as abruptly as if the line of separation had been marked by a graver; so that the part of the surface on one side of the line shall be almost totally devoid of any efflorescence, while on the other side it shall resemble the accumulation of hoar frost on the small branches of a tree.

The saltpetre formed in summer scarcely appears to contain a particle of any calcareous salt: that formed in winter contains most evident traces of such a salt, though probably even in winter the amount of this is not much above one part in two hundred of the whole mass.

A frosty, clear, and dry state of the atmosphere is particularly favourable to the natural production of nitre: but there seems to be a limit to its formation, on the same spot, even under the most favourable circumstances; the quantity of the nitre not continuing to increase after it has proceeded to a certain extent.

In a moist state of the atmosphere the formation either does not take place at all, or goes on slowly: and if that state of the atmosphere which is unfavourable to the production of nitre continue a sufficient length of time, the nitre already formed gradually disappears. At the commencement of these observations I attributed the occasional disappearance of the nitre to its mechanical removal from the wall, and supposed that it must have been by accident brushed off: but repeated observa-

tions convinced me this was not the case, its disappearance proceeding as gradually as its previous appearance; besides which, had it fallen from the wall, I should most probably have found it on the pavement beneath, which never happened to me. It afterwards appeared probable, although I have never met with any condensed moisture on the surfaces submitted to the foregoing observations, that the aqueous vapour precipitated from the atmosphere in the state of it above alluded to, might dissolve minute particles of the nitre, and be absorbed with them into the substance of the wall; but on this supposition nitre ought to be found in lixiviating a portion of the stone taken near the surface. I have however made the experiment without detecting any nitre in the stone so taken. But, in opposition to the idea of the absorption of the nitre into the substance of the stone, I found the efflorescence disappear in more places than one during the severe frost of the present year (1814), at a time when, from the temperature of the stone, if not of the air also, the absorption here supposed could not have taken place; since, that temperature being below the freezing point, the aqueous particles would by congelation have been rendered incapable of dissolving the nitre.

It is deserving of notice, that such a spontaneous disappearance of the nitre, as has been just mentioned, took place antecedently to and during the late heavy fall of snow on January 18 and 19.

Wishing to ascertain whether the free presence of atmospherical air be necessary in the natural process under consideration, I selected a part of the wall on which the formation of saltpetre usually takes place to a considerable extent; and insulated about a square foot of its surface which had been previously brushed quite clean. It was insulated by means of a plate of glass, the edges of the frame of which were covered with a cement, so as to exclude any access of air between the glass and the wall. As the depth of the frame was not more than the third of an inch, the inclosed space contained but an inconsiderable quantity of atmospherical air. On the following day, October 29, I observed that a formation of nitre had taken place on the part of the wall within the glass, but that it was not so extensively diffused, nor so abundantly deposited, as had been usual before the application of the glass; and the

crystals, which were distinctly prismatic, were much more accurately defined, and larger, than I had ever before observed them; in consequence, probably, of the tranquil state of the medium in which they were formed. On the day following, October 30, the quantity was increased; but it remained stationary from that time to November 12, when it began to diminish; and on November 16, there was no longer any appearance of it: nor did it re-appear in the interval between November 16 and 29. In the mean time the efflorescence had not only taken place on the adjacent parts of the wall in the usual manner, but had been more than once brushed off and again deposited, while no increase had taken place in that originally formed within the glass.

On November 29, the exterior surface of the glass was, for a purpose to be mentioned presently, covered over with whitewash; which was not removed till January 8, 1814. No observation could of course be made on the appearance of the surface within the glass during the interval that the glass itself was covered with whitewash; but no nitre was visible on the removal of the whitewash on January 8. It had, however, re-appeared before the morning of January 10, partly in separate capillary prismatic crystals, which were much larger than on the former occasion, and reached from the surface of the wall to the inner surface of the glass; and partly in small flocculent tufts; the whole quantity of the nitre formed being much greater than, and the manner of its formation being very different from, that formation which took place within the glass on October 29 and 30. Still, the whole quantity was not nearly equal to that which was usually formed on the same surface when exposed to the free action of the atmosphere. The increased quantity, however, formed in January, compared with that formed in October, corresponds with the observation, that the natural production of nitre is much influenced by temperature: but it is worth mentioning, that while the nitre formed within the glass in January, occurred either in distinctly prismatic crystals or in flocculent tufts, that which was formed on the adjacent parts of the wall was of the granular character above described in page 174.

Having by the foregoing experiment satisfied myself with respect to the necessity of the free presence of atmospherical

air for the full effect in the spontaneous production of nitre, I wished to ascertain the nature of the connexion between the nitre formed and the stone on which it is formed; and particularly, whether carbonate of lime simply would be sufficient for its production. I therefore made a nearly liquid paste with distilled water and prepared chalk,* with which I covered the exterior surface of the glass that had been attached to the wall for the purpose already mentioned: but though nitre was repeatedly formed in the neighbourhood of the glass, not a particle appeared on the whitewash during the space of nearly six weeks, from November 29 to January 8.

The foregoing statement contains the general results of all the observations I have hitherto been able to make on the present subject. I subjoin an imperfect analysis of the stone of which the laboratory of the Ashmole Museum is built, and of the saltpetre periodically formed on it; concluding with a few remarks on the local differences connected with a more or less extensive formation of that substance, and on its probable or rather possible source.

The stone of which the laboratory is constructed belongs to one of those alternating series of clay and sand, and calcareous freestone, of which the varieties of Bath stone form nearly the lowermost strata; and the Headington stone, of which the greater part of Oxford is built, the uppermost. It is principally made up of the *debris* of small sea shells, but frequently contains organic vegetable remains, and always some proportion of sand and ochry clay.

Six portions of this stone, taken from different parts of the laboratory, each weighing at least two hundred grains, were separately submitted to the action of a sufficient quantity of diluted muriatic acid. The undissolved residuum, which amounted in no instance to as much as four parts in a hundred, consisted of a yellowish brown ochry clay, mixed with a few particles of white sand, and small laminar fragments of a dirty-white colour, very much resembling portions of the siliceous

* As chalk sometimes contains magnesia, and almost always a small proportion of silex and alumine, I intend on a future occasion to repeat the experiment, using very finely pulverized crystallized calcareous spar, instead of chalk.

incrustation of the Geyser spring. Small flocculent shreds slowly subsided in the muriatic solution, derived probably from the membranous part of the shelly matter of the limestone; for this insoluble residuum, when thrown into red hot nitre, slightly deflagrated, and gave out an odour resembling burnt bones: and as this residuum had been collected without the use of a filter, the inflammable matter could not well have been derived from any other source than the stone itself.

The muriatic solution contained a small proportion of iron, and gave a very slight trace of magnesia. So that the composition of the stone may be thus stated:

Carbonate of lime 96

Oxide of iron, sand, ochry clay, and animal membrane 4

100

In offering the following imperfect analysis of the saltpetre produced in the situations above alluded to, it is necessary to state, that the quantities on which I have hitherto had it in my power to operate have been very small.

Some preliminary experiments made on a solution of saltpetre which had been formed during the summer, gave the following results.

The solution contained no disengaged acid or alkali, and, upon the addition of oxalate of ammonia, afforded the slightest possible evidence of the presence of lime. It contained minute portions of sulphuric and muriatic acid. A portion of it being evaporated, left a mass of crystals which, in their form, as in all their other characters, exhibited the properties of nitrate of potash.

As it is usually stated by writers who speak of the subject, that nitrate of lime is a principal constituent part of saltpetre formed by a natural process, I was much surprised by the very slight trace of lime evident in the present instance; though I had felt assured previously, that but little would be found in the natural saltpetre which I have had an opportunity of examining; having never observed in it any tendency towards deliquescence. Having had frequent occasion to suppose that carbonate of lime is much more readily soluble in water than is commonly believed, and having never been able to detach

the saline efflorescence in question from the walls of the laboratory, &c. without admixture of particles of the limestone, or of the whitewash, amounting to at least seven or eight parts in a hundred, it struck me, that these particles might be the source of the lime rendered evident by the addition of the oxalate of ammonia in the solution of the saltpetre. I therefore pulverised small portions of calcareous spar, of the common limestone of this country, and of whitewash; and having agitated accurately distilled water, at the common temperature, with each of these portions, I then filtered the water, and tested it with oxalate of ammonia. In each instance, there was fully as copious a precipitate as when the oxalate of ammonia had been added to an equal quantity of the solution of saltpetre.

Similar preliminary experiments having been made on some saltpetre detached from the same part with that already submitted to examination, but formed during the winter instead of the summer, the same results were obtained, with this single difference, that the precipitate obtained by the addition of oxalate of ammonia was much more copious: and I found this to be the case from whatever part of the laboratory or elsewhere the saltpetre had been detached, provided it had been formed during the winter. I could not extend the experiment on the saltpetre formed during the summer, having only reserved a portion from one spot.

Judging from such experiments as I have made, it appears that the saltpetre, formed in the situations described in this paper, consists of full 99 parts in 100 of nitrate of potash; with a very minute proportion of some calcareous salt, which is either not at all present in the saltpetre formed during summer, or is present in smaller quantity than in that formed during winter—though even in the latter instance it scarcely amounts to one part in 200.

The proportion of sulphuric and of muriatic acid, and the bases with which these acids are combined, I have not attempted to ascertain, on account of the minuteness of the proportion in which they evidently exist.

In considering the relative situations of the different parts of the laboratory, and of the other buildings also, in which salt-

petre is naturally formed, it is evident, that the efflorescence takes place only where the exterior of the wall on which it is formed is either exposed to the direct influence of the weather, or is in contact with the adjacent ground; not taking place at all in those instances in which the wall is neither exposed to the weather on either side, nor is in contact with the adjacent ground: from which it might be argued, that the effect depends upon the action of the external air, or of the moisture of the ground transmitted through the substance of the wall: but the result of that experiment, in which the action of the air on the interior surface of the wall having been prevented by the intervention of a glass, the formation of nitre took place only to a very slight extent, is in a great measure at variance with such a supposition.

Again: though it is evident that the natural production of the saltpetre is closely connected with changes in the state of the atmosphere, those changes relating not only to its temperature but also to the degree of its moisture and barometrical pressure; yet a much longer series of observations, and these not partial like the present, but carried on in various parts of the world, is requisite, before even this part of the problem can be accurately solved. There still would remain a part of much more difficult solution, namely, the source of the metallic base of the alkali of the nitre.

With respect to this difficult question, if we compare the elements present in the composition of the saltpetre formed, with the elements of the substances present during its formation, it seems a reasonable conclusion that the potassium, or the metallic base of the potash of the saltpetre, is either a simple principle of some of the elements present, or that it results from the union of two or more of those principles, or of two or more of the elements themselves.*

The gross compounds present during the formation of saltpetre, in the instances mentioned in this paper, are atmosphe-

* The terms "element" and "principle" are here used in the same relation to each other as the early physical philosophers used the terms στοιχεῖα ἀρχαί. They supposed that the former, though incapable of decomposition by common means, were not necessarily to be considered as absolutely simple substances: those absolutely simple substances they expressed by the term ἀρχαί.

rical air and the limestone on which the saltpetre effloresces; and all the component parts of these may be ultimately resolved into the following elements—oxygen, nitrogen, hydrogen, and carbon, together with iron and the metallic bases of some of the earths.

The component parts of nitrate of potash, of which the saltpetre under consideration almost entirely consists, are nitric acid, water, and potash; which may be resolved into the following elements—oxygen, nitrogen, hydrogen, and potassium: and all these elements are experimentally known to be present in the situations where saltpetre is formed, with the exception of potassium.

In the supposition then that the saltpetre is a product and not an educt of the above process, since no potash can be detected either in the air or limestone, the potassium must either be contained in a free state in the atmosphere or in the limestone, which from its remarkable attraction for oxygen is inadmissible; or it must be a component principle of some one of the elements present; or lastly, it must be itself a compound of two or more of the principles of those elements, or of two or more of the elements themselves.

But I am aware that the saltpetre may be considered as an educt of the process, and that it may possibly exist already formed in the atmosphere in a state of minute division: yet, when we consider the comparatively fixed nature of that salt, and that no experiments have yet detected its presence in atmospherical air, or in the moisture precipitated from atmospherical air; and lastly, when we reflect on the probability that the metals, of which potassium is one, are compound bodies, the former supposition seems upon the whole preferable to the latter.

February, 1814.

An Account of some Experiments on Animal Heat.

By JOHN DAVY, M. D. F. R. S.*

[From the London Philosophical Magazine and Journal, for Dec. 1814.]

THE recent inquiries of Mr. Brodie have rendered questionable the different prevailing hypotheses relative to animal heat, and have shown that fresh investigation is necessary, before we can expect to arrive at any accurate theory.

In the present uncertain state of our knowledge, three circumstances are particularly deserving of attention, viz. the relative capacities of venous and arterial blood for heat, their comparative temperatures, and the temperatures of different parts of the animal body.

On the first of these subjects we possess only the experiments of Dr. Crawford, which I believe have not yet been repeated, notwithstanding they form the basis of his hypothesis.

On the second, little inquiry has been made, and especially of late years, since the improvement of the thermometer.

And on the third, the observations that have been collected are very few in number, and, with the exception of those of Messrs. Hunter and Carlisle, are scarcely, perhaps, deserving of confidence.

Such were the inducements that led me to the consideration of each of these subjects apart, and to endeavour to acquire by experiment some more certain knowledge respecting them. The experiments that I have made will be described in the two following sections, and in the last will be offered the few remarks and conclusions which naturally arise, and are fairly deducible from the results.

1. On the Capacities of venous and arterial Blood for Heat.

I must premise, that my object has been to endeavour to ascertain the relative capacities of venous and arterial blood for heat, rather than their exact specific caloric. The latter, from many circumstances, is difficult to be accomplished; whilst the former is comparatively easy, and in a theoretical point of view is probably equally useful.

* From the Philosophical Transactions for 1814, part ii.

I have employed both the methods commonly used. I shall mention most of the experiments that I have made, without noticing the repetitions of them, and shall begin with those on the times of cooling of equal volumes of venous and arterial blood.

The blood used was from the jugular vein and the carotid artery of a lamb about four months old. It was received in bottles; and to remove the fibrin, which is a great impediment in experiments of this kind, it was immediately stirred with a wooden rod. In respect to colour, the difference between the venous and arterial blood was not so great as in the sheep's; and this in a great variety of instances I have always observed, the venous being of a less dark hue. The specific gravity of the venous blood, without the fibrin, was found to be 1050, and that of the arterial 1047.

A glass bottle equal in capacity to 2518 grains of water, and weighing 1332 grains, was filled respectively with water and venous and arterial blood of the temperature of the room 62, about four hours after the blood had been drawn, during which time each bottle had been closely corked. A delicate thermometer, by means of a perforated cork, was placed in the middle of the liquid. The bottle was then plunged into water of the temperature 140 Fahrenheit; and when the mercury had risen to 120, the bottle was quickly wiped and suspended in the middle of the room, and the progress of cooling was noticed every five minutes, till the thermometer had fallen to 80. The following were the general results obtained:

Water cooled from 120 to 80 in 91 minutes.

Arterial blood in 89

Venous blood in 88

Considering therefore the capacity of water for heat to be denoted by 1000, neglecting the effect of the glass bottle producing a difference only of about half a minute, and the same in each instance, and dividing the times of cooling by the specific gravity, the relative capacities of venous and arterial blood without fibrin appear to be as .921 and .934.

In the following experiments the same kind of blood and the same quantity was used as in the preceding. The mixtures were made in a very thin glass receiver containing a delicate thermometer. The temperature of the room was 66.

Hot water temperature 121; cold water 61. Mixture of the two 90, after two minutes 89, after three 88, and after eight 87.

Venous blood 121. Water 62·5. Mixture 89; after three minutes 88·5; after seven 87.

Arterial blood 121. Water 63·5. Mixture 89·5; after three minutes 88·5, and after seven 87.

Now, allowing about one degree of the cooling effect to have been produced by the receiver, indicated by the admixture of the hot and cold water, calculating the quantity of blood used from the knowledge of its volume and specific gravity, employing the formula given by Professor Robison, which consists in multiplying respectively the weight of the water and the blood by the change of temperature, and dividing the first product by the second, the quotient or specific caloric for venous blood appears to be as ·812, and for arterial as ·814, results very similar to those I have obtained with the blood of the sheep.

In the remaining experiments, blood with the fibrin present was employed, and, with this exception, they were perfectly similar to those already described.

The blood used to ascertain its time of cooling was obtained from a sheep; and one day the vein was opened, and on the next the artery. The capacity of the bottle employed exceeded that of the first by one ounce measure of water; but it was equally thin. The air of the room was of temperature 69.

Water cooled from 120 to 80 in 118 minutes

Venous blood in 112

Arterial blood in 113

And hence, as the latter was of specific gravity 1049, its capacity for heat seems to be as ·913; and as the former was of specific gravity 1051, its capacity appears to be ·903.

In the following experiment, equal volumes of fluid blood and of water were used; which was easily accomplished by means of a thin bottle with a large mouth, to which a cork was adapted, with a perforation more than sufficiently large to admit the bulb of a very delicate thermometer, and of course to allow, when the bottle was filled to the brim, the excess to flow out on the introduction of the cork, which was always similarly placed. To retard the process of cooling, the bottle was closely surrounded by a thick layer of what is commonly called cotton-wool. Its capacity was equal to five ounce measures of water,

or 2400 grains. It was first filled with cold water, which, when its temperature had been ascertained, was thrown into the receiver before used; it was next filled with hot water of temperature about 110, so that the heat of the glass might be nearly the same as that of the blood: and lastly, when the vein or artery had been opened, the bottle was immediately emptied and filled with blood, the temperature of which was ascertained by the thermometer in less than a quarter of a minute. The mixture now was instantly made, and by the same thermometer the highest temperature after mixture was discovered.

The four following trials were made on the blood of two lambs, both about five months old. The temperature of the air was 60.

Cold water 57·5. Venous blood 100. Mixture 80; after one minute 78·5.

Water 58. Arterial blood 103. Mixture 80; after one minute 79.

Water 58. Venous blood 101·5. Mixture 79; after one minute 78·25.

Water 58. Arterial blood 106·5. Mixture 81; after one minute 80.

The rate of cooling was not noticed after the first minute had elapsed, as the blood then generally began to coagulate. The specific gravity was only ascertained in the two last trials; that of the venous blood was found to be 1050, and that of the arterial 1049; and hence allowing, as before, one degree of the cooling effect to be produced by the receiver, the capacity of venous blood for heat appears to be ·852, and that of arterial blood ·839.

It is evident that these trials admit of less accuracy than the preceding; and much more confidence, it appears to me, is due to the third series of experiments; so that, if required, I should be inclined to give the numbers thence deduced, as the greatest approximation to the truth.

2. *On the comparative Temperatures of venous and arterial Blood, and of different Parts of the animal Body.*

To endeavour to ascertain the comparative temperature of venous and arterial blood, I have made a considerable number of experiments; some of which on lambs, sheep, and oxen, it

will be sufficient for me in this place to describe. In each instance, a long incision was made through the integuments; the jugular vein was laid bare, and the exact seat of the carotid artery found. The vein was then opened, and a small delicate thermometer introduced, and thrust about an inch up the vessel beyond the wounded part; and as the bulb of the instrument was small, the flow of blood was not stopped. When the mercury was stationary, its height was marked. The carotid artery next was divided, and the thermometer was immersed in the current of blood, and left there till it ceased to rise.

The following are the results of five experiments made on lambs, all of which were about three months old. The thermometer in the shade stood at 65.

1. Venous blood	102.5	Arterial blood	104
2. —————	104	—————	105
3. —————	104	—————	105
4. —————	103.5	—————	105
5. —————	104	—————	105

The following results were obtained from three experiments on sheep, whose exact age I could not ascertain. The thermometer in the shade was 60.

1. Venous blood	103.5	Arterial blood	104.5
2. —————	102.5	—————	104
3. —————	103	—————	104

The experiments on oxen were only two in number. The temperature of the air was 64.

1. Venous blood	100	Arterial blood	101.5
2. —————	100	—————	101

In both instances the oxen were knocked down before the vessels were opened; and as respiration had ceased in consequence of the injury of the brain and spinal cord, no difference of colour, of course, was perceptible between the blood from the jugular vein and that from the carotid artery.

These results, so different from what might have been expected, from the observations of Messrs. Coleman and Cooper on the temperature of the two sides of the heart, led me to repeat their experiments. The experiments in which I place most confidence were made on lambs about four months old, and to these I shall confine myself at present. In each instance the animal was killed by the division of the great vessels of the

neck; an opening was made immediately into the thorax, and a very delicate thermometer was introduced into the ventricles of the heart by means of a small incision. The operation occupied so short a space of time, that in three instances the right auricle had not ceased contracting.

1. Venous blood. 104	Left 106
Arterial 105·5	3. Rectum 105
Rectum 104	Right ventricle . 105·5
Right ventricle 105·5	Left 106·5
Left 106	4. Rectum 105
2. Rectum 105	Right ventricle . 106
Right ventricle 105	Left 107

I cannot well explain the difference which exists between the results of the preceding experiments, and those of Messrs. Coleman and Cooper, which are directly opposite. Can the mode in which the animals they experimented on were put to death, be the cause of the want of agreement? In death by asphyxia, there is generally an accumulation of blood in the right ventricle; and in many instances I have observed, when the right ventricle has been distended with blood, little difference of temperature between the two sides of the heart.

To describe all the experiments that I have made to ascertain the temperature of different parts of the animal body, would extend this paper to an unusual length, and there is the less occasion for a long description, as the comparative results were very similar. It will be sufficient therefore here to notice the observations made on the human body, and on that of a lamb.

That the thermometer might be equally applied to all parts of the surface, its bulb, in form nearly cylindrical, was fixed to a small piece of cork, hollowed and lined with fine wool, and thus half its superficies was applied in each instance. The observations were made on the naked body at seven A. M. immediately after quitting bed. The temperature of the air of the room was 70. The following were the results obtained:

At the central part of the sole of the foot	90
Between the malleolus internus and the insertion of the tendo Achillis, where the artery is felt	93
Over the middle of the tibia	91·5
On the middle of the calf	93

Over the popliteal artery at the bend of the knee . . .	95
Over the femoral artery in the middle of the thigh . .	94
Over the middle of the rectus muscle	91
Over the great vessels in the groin	96·5
About a quarter of an inch below the umbilicus	95
Over the sixth rib on the left side where the heart is felt pulsating	94
Over the same place on the right	93
Under the axilla, the whole surface of the bulb being applied	98

About an hour had now elapsed from the commencement of the experiment. The thermometer again applied to the sole of the foot rose no higher than 85, five degrees less than at first. A disagreeable sensation of cold was experienced, and particularly in those parts not supplied with large vessels, and out of the course of the great arteries. The body remained unpleasantly chilly till breakfast had been taken, and then a slight degree of pyrexia was perceived; the heat of surface being increased, the pulse quickened, and the mouth slightly parched. After breakfast, the thermometer was applied to both hypochondriac regions, and the left was found one degree higher than the right.

To ascertain the temperature of different parts of the surface beneath the integuments, the bulb of a thermometer was introduced through small incisions about half an inch between the skin and subjacent parts of a lamb just dead. The heat of the rectum was first ascertained, as a mean of marking the rate of cooling, and the different parts were then tried in the following order:

Venous blood in the jugular vein	105·5
Arterial blood from the carotid artery	107
Rectum	105·5
Over the metatarsal bone	97
Over the tarsal bone	90
Over the knee joint	102
About the head of the thigh	103
At the groin	104

Nearly a quarter of an hour had been occupied in making these observations, and the temperature of the rectum was now

found to be 105. The three great cavities were next opened in the order enumerated.

Near the lower part of the liver . .	106
The substance of the liver	106·5
The substance of the lung	106·5
The left ventricle	107
The right ventricle	106
The central substance of the brain	104
Rectum	104·5

Surprised at the temperature of the brain being lower than that of the rectum, I was led to repeat the experiment. It may be proper to notice a few of the results, as it is a curious circumstance which they confirm. The four experiments I shall mention were made on lambs. As soon as the animal was dead, the cranium was perforated, and a delicate thermometer introduced into the central part of the brain.

1. Brain 104	Rectum 104·75
2. Brain 104·75	Rectum 105·5
3. Brain 105·5	Rectum 106·5
4. Posterior part of the brain 105·5; anterior 103.	
Rectum 106·5.	

The temperature of the air at the time was 68. Different parts of the brain were found to vary considerably in temperature; the anterior, as already noticed, being lower than the posterior, and the superficial than the deep-seated parts.

3. Remarks and Conclusions.

That there is no material difference between venous and arterial blood in respect to specific caloric, excepting what arises from difference of specific gravity; that the temperature of arterial blood is higher than that of venous; and the temperature of the left side of the heart, than that of the right; and lastly, that the temperature of parts diminishes as the distance of the parts from the heart increases—are the general results of the preceding experiments.

Admitting the accuracy of these experiments, and I think that they will be found correct when repeated, what are their consequences in a theoretical point of view?

They are evidently in direct opposition to Dr. Crawford's hypothesis; the essence of which is, that the capacity of arterial

blood for heat is greater than that of venous, that there is no difference of temperature between the two ventricles of the heart, and, in fact, that the heat of all parts is nearly the same.

They are more agreeable to, and indeed they even support, the hypothesis of Dr. Black, that animal heat is produced in the lungs, and distributed over the whole system by means of the arterial blood.

Neither are they inconsistent with that hypothesis which considers the production of animal heat as dependent on the energy of the nervous system, and arising from all the vital actions constantly occurring.

Besides the results of the preceding experiments, many arguments may be advanced in opposition to Dr. Crawford's hypothesis.

As we never perceive a difference of capacity in bodies without a difference of form or composition; and as very slight differences of the former result only from great changes of the latter, it might be expected *a priori*, as no difference, excepting that of colour, has been detected between venous and arterial blood, that their specific caloric would be very similar. From analogy also, it might have been expected, that the capacity of arterial blood for heat would be much less than that of water, as water appears to exceed almost every other fluid, and as the capacity appears to diminish as the inflammability of compounds increases. But the strongest arguments against this hypothesis are to be derived from the recent experiments of Mr. Brodie, and those of MM. Delaroche and Berard.

Dr. Black's hypothesis appears to me far more satisfactory than Dr. Crawford's, and capable of explaining a much greater number of phenomena; but there are objections even to this hypothesis, which must be removed before it can with propriety be received.

The last hypothesis, which I mentioned, that which refers animal heat to vital action, has many facts in its support, and especially the results of Mr. Brodie's curious and interesting experiments; and the results of my inquiry, as I have already observed, are not incompatible with it. It may be said, that the viscera of the thorax and abdomen are of highest temperature, because these parts are, as it were, the elaboratories of life; and that the heat of the arterial blood, and of the parts best supplied

with this fluid, is greatest, because they lie deepest and abound most in the principle of life or vital action. This explanation was suggested to me by my brother Sir H. Davy. There are some facts which I have observed agreeable to it, but not more so than to the hypothesis of Dr. Black. I have found the stomach of the ox, the pyloric compartment, of a higher temperature than the left ventricle itself: thus, when the latter immediately after death was 103, the former full of food was 104·5. I have also found the temperature of young animals, in whom all the vital actions are most energetic, higher than that of animals arrived at maturity. I may mention here, in illustration of this statement, a few observations made on infants, as I am not acquainted with any yet published. In one instance I found the heat under the axilla of a child just born 98·5; after twelve hours 99, and after three days, the same; during the whole of which time it appeared in perfect health. On five other children of the same age, similar observations were made. In two instances of weak infants, the temperature, one hour after birth, was found not to exceed 96, which is two degrees below the standard heat of man in a state of health; but their respiration was still languid, and the next day the heat of the axilla had risen in one to 98·5, and in the other to 99.*

To conclude: As, in each hypothesis examined, difficulties are found to exist from facts or the results of experiments of an unbending nature, we must at present either suspend theory altogether and search for *experimenta crucis*, or adopt that hypothesis which is conformable to the greater number of facts. The first measure is certainly most philosophical; but to the latter we are naturally most inclined; and if I were questioned which view is preferable, I should make no hesitation in selecting Dr. Black's, which to me appears both most simple and most satisfactory.

* The opinion of Haller, I am well aware, is contrary to these results, as is expressed in the following paragraph: "Viri feminis calidiores duriori nempe sunt fabrica, contra pueri aliquanto minus calent quam adulti homines, ut modo natus puer vix calorem conservet, nisi sollicitè et copiose vestibus textus."—Elem. Phys. ii. p. 297. As this great physiologist seems to have drawn his inference merely from the circumstances mentioned, it can have little force, except from the authority of the author; to which may be opposed an equal authority, not less than that of Hippocrates himself: he says, in his fourteenth aphorism, "Qui crescunt plurimum habent calidi innat: senibus autem paucus calor."

On the Cultivation of Senna.

[From the Raleigh Star.]

MESSRS. EDITORS,

I UNDERSTAND that Senna has lately advanced in price three hundred per cent. It is a most valuable article of medicine, and perhaps its increased price is not to be regretted, as it will make us acquainted with our own resources, and compel us to improve them.

Some years since, the Medical Society of North Carolina (a valuable institution, which I am sorry to perceive is inactive and languishes, if it be not extinct) offered a premium for the production of the largest quantity of Senna, exceeding 40 pounds, raised by one person in one year. I accordingly sowed about a quarter of an acre, and obtained between fifty and sixty pounds of Senna, which physicians have said was much superior to the coast of Barbary Senna, and equal to the best which comes from the Levant.

Since Senna bears a high price, and is not easily obtainable at any price, I have hoped, that every person who keeps a garden, will not in future subject their means of health to the will of a foreign despot; and in this hope I am induced to send you for publication the information necessary to be known by those who are desirous of cultivating this valuable article.

It is a delicate plant, sensible to cold, rains and drought: The seeds should be committed to the earth about the first of May; the ground should be mellowed and the seeds planted in rows, covered an inch deep and four inches asunder.—The rows should be a foot or two apart, so as to admit of being worked, and the only tillage necessary is to keep it clear of weeds and to earth it moderately. If the season is dry or the soil thirsty, it would be benefited by an occasional watering. The plant in good soils grows to two-thirds of the height of indigo, but spreads more. The leaves (the valuable part) grow on long stems issuing from the trunk and branches.

Besides a drought, the Senna is exposed to another formidable enemy. When in bloom it is visited by a yellow butterfly which deposits its eggs upon the leaves in vast abundance.—

These eggs in a few days become worms, which destroy the leaves. I know no means of preventing the visitation of these troublesome flies, nor any expeditious mode of staying the advances of these eggs to the animal state. Sprinkling ashes over the shrubs has been recommended by some, and has suggested itself to me, as a probable means of being useful in both cases, but I have never tried it. The only mean which I have attempted was to brush off the eggs with a wing where I have detected them. This is a work of some labour. The eggs are small and white, and will not be observed without minute inspection. The later in the season the plant is in coming to maturity the more liable it is to the depredations of this butterfly progeny. Hence the propriety of bringing it forward as early as the season and its tender nature will permit.

The Senna is to be gathered once or twice a week as the plant is going on to maturity. When the lower leaves have gained their full size and begin to change their colour a little, pluck off a few courses of the lower stems: wilt them two or three hours in the sun, then spread and dry them in the shade, pick out the stems, put up the leaves in bags suspended in an airy dry situation.

The seeds are contained in pods which grow at the extremity of the stalk and its branches. As they ripen they become black and fall off. Gathering the leaves does not at all injure the production of seed.

A light rich soil is best. If sandy, it is liable to suffer from drought.

Senna is now *two dollars* a pound in Petersburg. The product of a quarter of an acre would be worth a hundred dollars. The value of the labour is so inconsiderable as to make a very small deduction from this amount. It would be profitable to cultivate for sale and export. But every family ought to cultivate it for private use. It is a most valuable cathartic, perfectly safe, mild in its operation, and a most powerful evacuant of bile, and as far as my observation extends, much superior to jalap and calomel, and certainly much preferable to those drastic drugs. It renders the operation more mild to add a few coriander or fennel seeds to it when a decoction is to be prepared.

JOHN WHITAKER.

Wake county, April 3, 1813.

SELECTED REVIEWS.

A Practical Explanation of Cancer in the Female Breast, with the Method of Cure, and Cases of Illustration. By JOHN RODMAN, M. D. One of the Surgeons and Medical Superintendants of the Dispensary and House of Recovery of Paisley. 8vo. pp. 240. London, 1815.

[From the London New Medical and Physical Journal, for May, 1815.]

IN taking a survey of the whole catalogue of “ills which flesh is heir to,” there is not one which strikes such horror into the human mind as that which is the subject of the volume before us. If hydrophobia be terrific in its appearance, and almost invariably fatal in its result, still the victim of its fury is soon released from corporeal sufferings by the welcome hand of death. If pulmonary consumption be almost as certain in its melancholy termination as hydrophobia, while its career is often long protracted, yet the patient’s sufferings are comparatively trifling, and hope gilds every prospect till the last curtain falls!—Not so in Cancer,—there agonizing pain of body keeps the sympathising mind perpetually on the rack, and hope, “which comes to all,” but rarely illumines the gloomy prospect of the unhappy patient. The ravages too of this dreadful disease, though accompanied with such torment, are cruelly slow. A fætid and horrid-looking ulcer gradually destroys every thing in its way, till the bones themselves are corroded, and the patient sinks from the general and local irritation, or from the repeated hæmorrhages occasioned by the destruction of those arteries that lie within the range of the malady!

No part of the human frame, in either sex, is so frequently the seat of Cancer, and also of those tumours which have been mistaken for incipient cancers, or schirrhi, as the female breast; and it is the disease, as it affects this particular organ, which our author has selected for his Essay. After so many authors had written on this disease, without explaining its nature or offering any thing like a successful method of treatment, we confess that we opened the work with a gloomy presentiment that this would but swell the catalogue, without in-

creasing our stock of knowledge, or furnishing us with any means of combating the evil. The work, however, turns out to be something like the Alchemist's search after the Philosopher's Stone, whereby many things were found which were never sought for; since the whole drift of our author's reasonings tends to prove, that there is no such thing as Cancer of the breast; at least, that there is nothing peculiar in Cancer, but what arises merely from the nature of the parts attacked with inflammation and ulceration. In his endeavours to establish this doctrine, if he is unsuccessful in his object, he has conferred a very great obligation on the profession, by pointing out and drawing their attention to those numerous cases of indurated *mammæ* which the routine practitioner heedlessly pronounces to be of a schirrhous or cancerous nature, and either advises extirpation, or sows the seeds of alarm and misery in the patient's mind, thereby greatly aggravating the original disease, which, by soothing treatment and mild yet judicious applications, might have been entirely removed. In showing, therefore, how much may be done by medicine and regimen for the removal of tumours which are *suspected* to be schirrhous, Dr. Rodman has given us a more useful book, than any which could have been written by the ablest practitioner on Cancer itself.

We must be allowed to observe, *in limine*, that although Dr. Rodman is perpetually railing against theorists and men of genius, there is scarcely a page of his own work which does not contain theoretical speculations, which in most instances are palpably obscure, we had almost said unintelligible, and conveyed in the most unhappy, the most uncouth, and often the most ridiculous language. Mixed up with these defects and blemishes, we can clearly discover genuine good sense, acuteness of observation, and judicious practice; circumstances which amply compensate for the imperfections alluded to, and which we point out as independent and unbiassed Reviewers, for the sake of the author himself, who will doubtless profit by the honest and disinterested advice herewith offered.

The work, though formally divided into chapters, is so singularly devoid of method or arrangement, that it almost bids defiance to any attempt at analysis. By a careful perusal indeed of its contents, we could, from the impression on our memory,

convey to our readers a very just conception of our author's opinions and practice, in our own words; and to this plan we shall be forced to resort, in most instances, during the present critique.

The first chapter, "The feeble structure of the female constitution," conveys to us, with endless circumlocution and obscurity of language, the knowledge of a fact which is familiar to all medical men of reflection and observation, but which is little attended to by the host of routine practitioners; namely, that in both sexes, but particularly in the female, certain affections of the mind have a powerful influence in deranging the functions of the body, more especially the functions of the digestive organs.

"There is an affection," says our author, "with which females are afflicted, appearing next to that of an inherent or universal disease among them, and this is a state of the stomach whereby digestion of food is often imperfectly performed; and during such a state, the bowels are usually constipated. The effects resulting from both of these occurrences upon all the system, are indubitably hurtful." p. 7.

This is true; and it might also have been remarked, that disordered states of the digestive organs arising from other causes than mental emotions, produce and aggravate that fickleness of mind and irritability of temper, which in their turn re-act on the corporeal functions. So intimate, in short, is the sympathy or connection between mind and matter, in these cases, that it is generally impossible to say where the malady originally commenced.

In the second chapter Dr. Rodman treats of the "disposition of mammary glands, and origination of tumours." After remarking on the complicated and vascular texture of the female breast, he thus proceeds to account for the "origination of tumours."

"Even in the best of health, each gland, to a certain extent, swells and subsides frequently, from the quantity of fluids which enter the vessels at one time and leave them at another, so that their contents are often varying in bulk. This variety of contents arises from several causes, but one is the power of uterine influence, by which, at the catamenial periods, fluids are injected into the vessels more abundantly than at the times intervening. And during such a state, it is very

usual for partial obstructions to occur, and small knots to form in the body of the breast, without exciting troublesome feelings, or requiring any extraordinary attention. Knots of this kind are generally of short duration, and being customary, exist many times unnoticed." p. 17.

If this be the case in health, our author asserts that it is still more so in disease, and in fact, that mental commotions and corporeal ailments augment, if they do not occasion the generality of mammary enlargements. Two of the principal external causes of the origination of tumours in the female breast are long pressure and sudden violence. Of the former, *tight lacing* is the most prominent and dangerous, since, as it acts gradually, and the feelings from it are not severe for some time, it meets with less attention.

"But this leads me," says Dr. Rodman, "to notice what I have already mentioned, that the mammary vessels, even when healthy, are naturally subject to a state of periodical plethora; a state which is afflictive only when the body is diseased and irritable. Now, if weakness and irritability of the frame, catamenial excitation, and diseased turgidity and tenderness of the breast, in consequence of pressure, be all experienced at the same time, the individual is greatly disordered, and becomes one of those vexatious cases, wherein Mr. Abernethy says, the mammary gland seems to be a nidus for carcinomatous action." p. 21, 22.

The effects of external violence occasioning tumours in the female breast need not be dwelt upon, nor those indurations resulting from milk abscesses, or milk gorged in the breasts from early weaning. But it is useful to bear in mind, that under all these circumstances, the application of cold is singularly powerful in producing swelled lymphatics, or lacteals thickened and tense like small cords, with numbers of bulky or clustered glands dispersed over several parts in the body of the breast. It is generally at these times, when the breast is suffering from affections of cold, that shooting pains occasion so much alarm to the patient. The second section, or remainder of this chapter, entitled "*Probable affections*," is entirely filled with unintelligible theory, while our author is every where exclaiming against genius and speculation!

The third chapter, on "The locality of mammary disease

arising from affections of the mind," is more interesting, and exhibits our author in a favourable view. He very justly observes, that a large class of females "disregard the concerns of health, as though it were unworthy of esteem," till it is lost, or till some painful affection (especially a mammary one) rouses their attention, and then life seems highly precious, and they are all alarm for its safety! Our author asserts and we have reason to believe his assertion, that when the mind of a female is rendered anxious by, and her attention drawn to, any painful sensation in the mamma, the local affection is so much under the influence of mental agitation, that it is almost instantaneously aggravated thereby, and continues to fluctuate according to the state of the *mind* as well as of the body, throughout the disease. He justly observes also, that there is a peculiar sympathy which reigns amongst females respecting cancer in the breast, that causes the most afflictive sensations of alarm, when any friend or acquaintance is distressed with a mammary tumour named cancer. The idea of a lingering and painful disease, or a terrible operation, preys upon their minds.

"Hence, the lively conception of sufferings from the mamæ of others, affects these organs in themselves, by their attention resting upon them, which, in progress of time, occasions a painful plethora of a similar part." p. 57.

Though this may be termed a *fanciful* doctrine, we believe it to be founded in fact, and it points to useful hints in the method of treatment. This supposition explains the fact of mammary affections being more active in some districts than in others; and also why, as practitioners have often remarked, an unusual number of females apply for medical advice respecting diseased breasts immediately after the amputation of a cancerous mamma in the neighbourhood. It may also explain why the disease has even been considered hereditary, since it is natural to suppose, that the daughter who has long witnessed the sufferings of a cancerous parent may be easily led to conclude, that every pang in her own breast is only a prelude to what her mother endured from cancer of the same organ.

Dr. Rodman brings forward cases illustrative of this sympathetic affection of the breast, which are sufficiently convincing, but we deem it unnecessary to quote any of them.

In the fourth chapter our author endeavours to show, that on real criterion of *schirrhous* tumours exists; and, in short, that all tumours may become what is termed cancerous, if neglected or mismanaged, the whole phenomena being the result of inflammation, preceded, in general, by local plethora, and mental or corporeal disorder.

“When such a state of inflammation is repeatedly occasioned, the small glandular bodies around the tumour continue to harden, and adhering to its surface, become part of its body. The morbid production depends upon the frequency, and also upon the continuance of the inflammatory process, both for its bulk and for its figure. The hardness results likewise from similar causes; and as for the *arrangement of fibrous texture*, in the internal structure of a diseased mass, it seems to occur in consequence of *various degrees of the inflammatory process*, by which, taking place while the body is afflicted with different degrees of indisposition, may be viewed as almost sufficient to produce an endless variety.” p. 81.

Now, although we are unable to offer any explanation of that singular “*arrangement of fibrous texture*,” which distinguishes cancer, or rather schirrhus, and from which it probably derived its name, yet we believe that few medical men will consider the elucidation of our author as at all satisfactory. The ligamentous bands which issue from the nucleus of the tumour, *like radii from a centre*, are not what might be expected from successive and various degrees of inflammation, for in the latter case they would be like the layers of an onion, or circling round, instead of issuing from a common centre. But it is time to leave theory and return to practical points.

The fifth chapter is entitled “The Influence of Cold.”

After some judicious remarks on the delicacy and susceptibility of the female constitution, Dr. Rodman proceeds thus:—

“It has already been seen, that indigestion is a very common and hurtful complaint among the sex. Every thing, therefore, which has a tendency to this complaint, tends infallibly to increase the disposition to disease. If they be over-heated and fatigued, then for some time exposed in this state to a current of cold air, or other cold medium, the sense of immediate injury may, perhaps, be trifling; yet sickness at stomach, and an unhealthy colour of the excretions, are apt to come on the following day. Not only so, but a considerable languor of body,

and an increased constipation of the bowels will often be experienced for a day or two after an occurrence of this kind." p. 87.

Dr. Rodman compares this to the action of cold on the female breast.

"When the body is much cooled, either by the action on the trunk, or by the cooling process on the extremities, the sense of chilliness is stronger in the diseased breast than in any sound part. Each chill is felt in its passage, and lodges in the breast with painful sensations." p. 88.

Dr. Rodman instances the disease commonly called a "*weed*," originating, as is well known, in cold caught during the puerperal state; a condition of body susceptible of atmospheric transactions.

We shall condense a few of Dr. Rodman's cases, for the sake of showing his practice. At page 93 commences the case of Mrs. H. aged 30, mother of three children. After having been fatigued by washing, and exposed during perspiration to currents of air, she was affected with a glandular swelling in the right breast, which resisted the usual applications for three months, when our author was consulted.

"Upon examining the part, the tumour was found to be oval, and nearly three inches in length. All the breast was swelled and tender, containing a number of distinct tumours scattered over different portions of the gland. Numbers of the lymphatic vessels were tight and bulky, the axillary glands were very large, and the surrounding substance was tumid, lumpy, and painful."

Twelve ounces of blood were taken from the arm, and a saline cathartic prescribed. The swelled parts were ordered to be fomented with a decoction of flor. anthem. et ex. hyoscyam.; after which they were to be dried and covered with wool. During a week this plan was continued, when

"—the swelling and tenderness of the mamma were abated—lancinating pains seldom and mild. The relief from pain and uneasiness has had a very happy effect in soothing the mind. The fomentations were resorted to twice a day for a week longer, according as any soreness threatened to return. Mild laxatives were prescribed—the breast and shoulder were rubbed with ung. camph. and both were strictly covered with

additional pieces of flannel. In the course of three months there was neither tumour nor induration in the mamma, nor swelled gland in the axilla, and twelve months afterwards there was no return of the complaint."

The next case adduced was of long standing before our author was applied to, and several medical men had been previously consulted.

"The first said, that the disease had all the symptoms of cancer, and advised her to the use of mercury. The second, that it was not yet cancer, but would soon be cancer. The third had no hesitation in saying it was cancer, and was sorry to add that there was no remedy; for though the breast were cut, the disease would return."

After this she had taken mercury, and used cooling applications to the part, which greatly aggravated the complaint. Dr. Rodman ordered the bowels to be opened, and a cataplasm, composed of chamomile decoction, lintseed meal, and a solution of mur. ammon. in which had been dissolved ex. hyoscy. to be kept to the parts.

In three days the swelling and pains were abated, and the poultice was only applied during the hours of sleep. The day time, the parts were occasionally rubbed with the tinct. saponis, and covered with cotton wool, after being washed with warm soft water, and dried, page 102. In a little time her mind became more tranquil as the corporeal disorder subsided, and in a short time she perfectly recovered.

The sixth chapter is a recapitulation of the preceding, and defies analysis, which, however, is unnecessary. Our author has strangely enough pitched upon this chapter to introduce the great body of his cases, some of which we shall briefly notice. The first, (p. 112) is that of a young female Highlander with a tumour in the left breast, accompanied by pains of a darting nature, and swelling and soreness in the glands of the arm-pit. She had been accustomed to a sedentary life, and was advised by our author to change it for a more active one, —to frequent a medicinal spring in his neighbourhood, to keep her bowels open, and pay attention to general warmth of clothing, and particularly to preserve a uniform temperature in the diseased gland by local coverings of flannel.

"In a few months, the mammary tumour vanished, as well as the tumours in the arm-pit."

The next case, p. 115, is that of a young woman, who had received a blow on the breast, succeeded by hardness and swelling. After hearing that a breast was amputated in the neighbourhood, her's became suddenly worse, and on applying to the operator was advised to have the tumour removed by the knife. In six days after this, the glandular swelling was of course much aggravated, and her mind was greatly disturbed.

"From the good state of her health, I had every reason to assure her that she had no danger to fear, providing she covered the breast with one or two folds of flannel, and took care to bathe it frequently with warm vinegar." She speedily lost all trace of disease.

In a chapter on the propriety of extirpating mammary tumours, there are many sensible remarks and shrewd observations. The following extract merits insertion.

"It deserves to be remarked, that a considerate surgeon is usually more averse, after he is advanced in life, and the knowledge produced by practice, to advise extirpation for a recent tumour of the mamma, than in early life with less experience. This circumstance would almost prove, that practical observations, in the treatment of such tumours, occasion fewer fears than those that are roused from the speculative notions entertained at first. When his mind is impressed with them, he is very apt to consider every bulky absorbent gland, whether swelled by cold or enlarged by common inflammation, as infected by some unknown but deadly agent. Hence the patient is liable to undergo a painful operation for the cutting out of all these enlarged glands; or may be doomed to a state of fatal misery, from hearing that the distemper is pronounced incurable, which leaves her without hope, and subjects her to the destructive influence of despondency. Yet the absorbent glands, as may be seen from the foregoing cases, are often swelled in a few hours, and with proper management, the swelling can be subdued in an ordinary space of time." p. 195.

The ninth chapter is on "the Ulcer of the Mammary Induration, commonly called Open Cancer," and our author's theoretical explanations of the phenomena are mysteriously sublime, and most happily unintelligible. The following is one of the most luminous passages.

"The over abundance of matter causes a greater proportion

to be settled, and to adhere upon the surface, where, by the activity of the putrefactive process, to which this ulceration is disposed, encouraged by the power of animal heat, and the septic application used, it soon corrupts. The corruption increases the acrimony of this matter, and that again the diseased action, until the general health, and in some instances, the bones be seriously *infected*." p. 203.

Thus, gentle reader, you have explained to you, the malignant nature of cancerous ulceration, by a man who is the avowed enemy of all men of genius or theoretical speculation!

But the goal of our analysis is in view, and we must give our readers as much of the useful matter as possible. As an application for correcting the peculiar fœtor of a cancerous sore, Dr. Rodman recommends it to be washed with tepid infusions of gentian, columba, or chamomile.

"A poultice of chamomile flowers, when properly stewed and softened, is peculiarly efficacious. The state of such a patient is greatly improved by drinking a sufficient quantity of port wine, and using a poultice of this kind at the same time. It should be made to surround the breast, and ought to be renewed every six or eight hours till the fœtor is subdued, washing the ulceration at each removal with some of the bitter infusions, by means of a syringe. During this, however, it is necessary to preserve an agreeable degree of bodily warmth, and to keep the bowels open." p. 206.

When the fœtor is subdued, the ulcerated surface may be covered with antiseptic powders, as cinchona, and several bitter roots, washing the parts as before. In this way, chalybeate powders may be used with advantage.

We have now exhibited the prominent traits of the work before us. We think Dr. Rodman has entirely failed in his elucidation of *cancer*; but that his work is extremely useful for the great body of general practitioners, as it will show them, that numerous indurations of the female breast, which have hitherto been considered as *schirrhi*, may be successfully treated, by a few simple remedies, without alarming themselves or their patients with the frightful name of Cancer.

Observations on the distinguishing Symptoms of three different Species of Pulmonary Consumption, the Catarrhal, the Apos-tematous, and the Tuberculous; with some Remarks on the Remedies and Regimen best fitted for the Prevention, Removal, or Alleviation of each Species. By ANDREW DUNCAN, Senior, M. D. &c. &c. 8vo. pp. 169. Edinburgh, 1813.

[From the London New Medical and Physical Journal, for October, November and December, 1814.]

LONG and gloomy is the catalogue of physical sufferings to which man, placed at an immeasurable distance above other animals, by his characteristic excellencies of material organization, and by the exclusive attributes of reason and intelligence, stands incessantly exposed:—heavy the tribute which, at the shrine of eternal and unerring justice, he is called upon to pay for this proud pre-eminence in the scale of created being. Civilization too, with all her charms and blandishments, introduces among her favoured children a train of evils and diseases, which are almost unknown to the more wild and rugged walks of savage life.

Amid the sufferings and the diseases which this catalogue exhibits to our view, pulmonary consumption stands inscribed in distinguished characters of terror and devastation. Fifty-five thousand victims are said to be swept off annually by it, from the soil of Britain. This is, we trust, an exaggerated statement. With the vulgar, every malady, of which extreme emaciation constitutes a striking feature, however different its origin and essence, is designated by one familiar and indiscriminate term. And medical men, we fear, too frequently cloak beneath that chilling and portentous name, “consumption,” their own carelessness or inefficiency; and thus prematurely quench every hope still fondly cherished in the bosom of friendship and of affection.

Yet terrible—most terrible, not merely from their extent, but from their peculiar nature and severity, are the ravages committed by this relentless foe of human happiness and enjoyment. Her meagre and unsparing hand plucks not the hoary weeds, the fruitless thorns and brambles of our worldly wilder-

ness. The sensitive plant, the lily, the passion-flower, and the rose of human gentleness and excellence, are almost exclusively the objects of her rapacity. Upon the cheek, tinted with the warmest hues of youth, of beauty and intelligence; upon the eye, illumined by the fire of genius and sensibility; upon the heart, throbbing with benevolence, and animated by all the gentlest and most noble affections that can adorn or dignify the human character, this fiend of desolation delights to prey. Her very name conveys to the generous mind a sensation of chilliness and dread. Whenever that hopeless sound strikes upon our ear, scenes of woe and wretchedness, to which we have in past years been witness, flit across the darkened mirror of recollection;—the venerable form of age, bent in silent anguish over the faded, sinking wreck of all its earthly hopes and happiness;—ardent and impassioned manhood straining, with convulsive agony, to its widowed heart, the cold but yet lovely and interesting relics of plighted tenderness and truth;—unconscious infancy gazing with artless merriment upon the hectic cheek of its faint and gasping mother, or perhaps, drawing the seeds of future suffering and death from her shrunk and almost exhausted bosom. These are scenes which we can never turn to contemplate without emotion. Against the depressing influence of such recollections, long familiarity with spectacles of human misery, and the stern habits of retirement and criticism, have not yet sufficiently fortified our nature. A more than common gloom, inspired by such meditations, and by the acknowledged inefficacy of every attempt yet made by human science and industry, to oppose this desolating malady, hung over us, as we sat down to the perusal of the present work. Not even the reverend name of Duncan possessed a charm, sufficiently potent to dispel it.

To investigate with patience, and discriminate with accuracy, the various species and modifications of any given disease, are assuredly objects, than which, none more important can occupy the attention of medical observers. And where the modifications of such disease are found, as in pulmonary phthisis, to possess strongly-marked features of distinction, upon a correct appreciation of which the knowledge of their origin and probable termination, and the decision of an appropriate plan of medical treatment, must be founded; this truth, in all

cases, most evidently applies with peculiar force. Thus viewed, the labours of Dr. Duncan come with no feeble claim to our respect and consideration. Striking differences of character, among those pulmonary diseases, classed, from the similarity of termination, under one common title, must, particularly in the incipient and more early stages, have obtruded themselves on the notice of every man, gifted with a common portion of discernment and penetration. Not a day, it is to be feared, passes, but many cases of phthisis, capable of great and even permanent relief by the well-directed resource of science, are abandoned as hopeless: some of which, terminating successfully from the unassisted energies of nature, serve only to deck, with unmerited honour, the nostrum of some vile empiric, and to degrade the regular physician in the eyes of the public.*

In corroboration of this remark, and as a specimen of the style and design of our author's publication, we transcribe a passage at length from his introduction; to some parts of

* We adduce, in support of this bold assertion, the following case; for the truth and accuracy of which, we pledge ourselves. A young woman, after suffering two months from pulmonary disease, was seized with purulent expectoration, and all the othersymptoms of confirmed phthisis. Her case was considered hopeless by her medical attendants; and she was abandoned to the care of a very young and inexperienced man, with strict injunctions that nothing but occasional doses of opium should be administered. He found her, upon his first visit, lying upon her back in bed; her countenance pale and deathly; her eyes closed; her respiration short, and excessively laborious; her power of utterance gone. The body was covered with a clammy moisture; the pulse could no longer be felt. The inferior extremities were greatly distended by serous effusion. The poor girl was supposed to be dying. A jug, containing about one pint of nearly unmixed purulent matter, stood upon a table by the bedside. This attracted the attention of our young inquirer. He was told that the whole had been coughed, or rather vomited up, within two hours. He investigated minutely the history of the case. The girl had evidently been affected with chronic pneumonia. The inference was obvious. Such expectoration could only arise from extensive *vomica*, not from *tubercles*. A large vesicatory was applied to the sternum; heat to the extremities. A light cordial evidently recruited the nearly exhausted system. Opium and digitalis were administered, at regulated intervals; mild nutritious aliment directed to be frequently given, in small quantities. Under this plan, the state of the patient was hourly ameliorated. In three days, she sat up; in a week, quitted her chamber. Steel, alkalis, and bitters, completed her restoration. This happened several years since. We believe her to be still living in health.

which, sensible and judicious as we, upon the whole, consider it, strong and obvious objections, hereafter to be noticed, present themselves.

“The following remarks on that interesting subject, (phthisis) are the result of observations made with fidelity and attention for more than half a century. And if they shall enable future writers to improve the means of distinguishing the different modifications of pulmonary consumption from each other, they may be productive of some benefit to mankind: For by proper treatment, adapted to each particular modification from an early period of the disease, there can be no doubt that many valuable lives may be saved.

“By phthisis pulmonalis, or pulmonary consumption, is to be understood, that affection in which a general wasting or consumption of the body arises from a disease of the lungs. Among eminent writers, it has been a subject of dispute, whether phthisis pulmonalis can ever be considered as a proper idiopathic disease. By many, it has been regarded merely as symptomatic of other affections, particularly of hæmoptysis, catarrh, scrofula, pneumonia, and several other genera. But there can be no doubt, that it may justly be considered as an important genus by itself; and that it very frequently makes its approaches in such a gradual and imperceptible manner, as to be beyond the power of art, before it be certainly discovered to exist.

“In every instance of this affection, that modification of fever, which has been termed *hectic fever*, is very generally observed some time before a fatal conclusion takes place. And this fever principally, perhaps even solely, arises from the absorption of purulent matter, or rather from the absorption of a sanious or vitiated purulent matter, which produces in the human system effects much more deleterious than the absorption of mild pus, void of any peculiar fætor or other strong sensible qualities. Such a sanious matter, however, when generated in the lungs, may be afforded from different causes. Hence, among those writers who have considered phthisis pulmonalis as a genus of disease, that genus has been divided into many different species. In the system of Sauvages, twenty species are enumerated under this genus. But from such minute divisions, no benefit, and much inconvenience arises.

Hectic fever, indeed, produced by purulent matter absorbed from the lungs, may arise from many different accidents, and many different diseases: And thus, it cannot be denied, that there is a foundation for many different species of phthisis. But after, in these cases, phthisis is induced, such species can neither be distinguished from each other by the symptoms, nor do they require a different mode of cure. A more simple view, therefore, of the divisions of this genus may be taken with advantage.

“In the division of any genus of disease into species, two great objects are to be had in view. The first and principal object is to point out such species as require a different mode of practice from each other. And the second object is to point out those species which can be distinguished from each other by obvious symptoms during the life of the patient. The distinction of species, which can be discovered only by dissection after death, serves merely to perplex and puzzle, without being of any material benefit. On this general ground, and with these objects in view, in phthisis pulmonalis, *three* different *species* may be pointed out, which may not only be distinguished by obvious symptoms during the life of the patient, but which also require some difference in that mode of treatment best fitted for the removal of each.

“These species may be distinguished by the titles of the *catarrhal*, the *apostematous*, and the *tuberculous* phthisis. The principal circumstance between these, requiring variety in the mode of treatment, is the difference in the source from whence the purulent matter is derived. In the first modification, it is merely separated from an inflamed surface, in a manner similar to the separation of pus from a blister-issue. In the second modification, it is furnished from an abscess of a considerable size, which may be formed in the cellular substance of the lungs, as well as of any other part of the human body. In the third, it is furnished from a tubercle, or from the parts surrounding a tubercle, terminating in suppuration; and commonly yielding, not proper purulent matter, but rather an ichorous sanies, somewhat resembling that which is often yielded by lymphatic glands, in cases of scrofula, when they terminate in suppuration. But the distinction of each of these modifications, during the life of the patient, can only be drawn

from an accurate account of the symptoms with which they are attended. And with that intention, a short history of each is subjoined.

“In every modification of phthisis, the symptoms may be referred to three heads: the pneumonic or pulmonary symptoms; the symptoms of hectic fever; and the supervening affections, or what may be termed the consequent symptoms. The morbid affections, however, referrible to the last two heads, are very much the same in all the species mentioned above; and it is always principally, often entirely, on the pulmonary symptoms, that the three species obviously differ from each other. In describing these affections, then, with a view to the diagnosis, it will be sufficient to give a separate account of the pneumonic symptoms occurring in each different modification of pulmonary consumption.”

After the introductory Remarks upon Pulmonary Phthisis, Dr. Duncan proceeds to delineate the “pneumonic symptoms” occurring in each of the three species of this disease, to the consideration of which his work is exclusively devoted.

His first chapter is occupied by a description of the morbid phenomena exhibited in the incipient stage of “catarrhal phthisis.” This is sufficiently minute and correct; but presents nothing peculiarly claiming attention or comment. At the close of this chapter, the ingenious experiments of the much-lamented Charles Darwin, to determine the chemical properties which distinguish pus and mucus, are noticed; and a summary of the conclusions to be drawn from them, accompanied by some comments of the doctor, is delivered. These we shall transcribe. They involve questions of high practical importance; and are not, perhaps, generally or accurately understood by the many, whose attention, absorbed in the ceaseless cares and labours of practice, is diverted from cultivating, or improving, an acquaintance with the arcana of experimental chemistry.

“1. Pus and mucus are both soluble in sulphuric acid, altho’ in very different proportions, pus being by far least soluble.

“2. The addition of water to either of these solutions decomposes it. The mucus, thus separated, either swims on the top of the mixture or forms large flocculi suspended in it; whereas, the pus falls to the bottom, and forms, on agitation, an uniform turbid mixture.

"3. Pus is diffusible through diluted sulphuric acid, though mucus is not; and the same also occurs with water, or a solution of sea-salt.

"4. Nitrous acid dissolves both pus and mucus. Water added to the solution of pus, produces a precipitate, and the fluid above becomes clear and green; while water and the solution of mucus form a turbid dirty-coloured fluid.

"5. Alkaline lixivium dissolves, though sometimes with difficulty, mucus, and generally pus.

"6. Water precipitates pus from such a mixture, but does not precipitate mucus.

"7. Where alkaline lixivium does not dissolve pus, it still distinguishes it from mucus, as it then prevents its diffusion through water.

"8. Coagulated lymph is neither soluble in concentrated nor diluted sulphuric acid.

"9. Water produces no change on a solution of serum in alkaline lixivium, until after long standing, and then only a very slight sediment appears.

"10. Corrosive sublimate coagulates mucus, but does not coagulate pus."*

"If these conclusions," our author observes, "be well founded, and hold at least generally, if not universally, it appears, that strong sulphuric acid and water, diluted sulphuric acid, and caustic alkaline lixivium and water, will serve to distinguish pus from mucus; that the sulphuric acid can distinguish it from coagulable lymph; and the alkaline lixivium from serum. When, therefore, any one entertains doubts about the composition of expectorated matter, let him dissolve it in sulphuric acid, and in caustic alkaline lixivium, or the aqua potassæ, as it is now styled in the Edinburgh Pharmacopœia. Let him then add pure water to both solutions. If there be a precipitation in

*Is it not extraordinary, that in the present improved state of animal chemistry, we have no correct account of the chemical composition of pus? Mucus, is reported by Brande, to consist of albumen and uncombined soda. Recent observations favour an opinion, that a conclusive diagnosis between pus and mucus might be drawn from an accurate examination of their physical properties. Dr. Young presents some highly valuable and interesting remarks upon this subject, in his late publication on "Medical Literature." They are transcribed at page 115 of the second volume of Dr. Thomson's "Annals of Philosophy."

each, he may be assured that some pus is present. But if there be a precipitation in neither, it is a certain test that the expectorated matter consists entirely of mucus."

We respect the opinions of the venerable Dr. Duncan. We deplore, in common with all others, to whom the interests of medical science are dear, the loss which that science sustained by the death of the estimable young man, whose early labours on this interesting department of animal chemistry we are now called upon to review. But truth yields with us to no secondary consideration: and we, with regret, state our conviction that these experiments, however scientifically or cautiously conducted, do not establish the distinction, between the chemical properties of pus and mucus, in a manner so satisfactory and conclusive as our author seems to imagine. Upon the matter, expectorated from suppurating tubercles, experience leads us to assert, that the result of these trials is particularly ambiguous and equivocal. That experience too has engraven upon our mind a caution, the intimation of which may not be unprofitable to others, who, from an honourable solicitude to determine the character, and anticipate the termination, of any individual case, enter upon this attractive path of inquiry: Chemical tests, *of the utmost purity*, should be employed; or the inquirer will find himself involved in tenfold perplexities and error.

Verbal criticisms are commonly contemptible. We are decidedly averse from their employment; and never condescend to it, except when called upon to express our disapprobation of terms applied with obvious want of accuracy and precision, or calculated to convey erroneous notions respecting the nature of the object they are intended to designate. On these principles, we object to the term *catarrhal* phthisis, by which Doctor Duncan, throughout his work, denominates one of the three species of pulmonary consumption, upon which he treats.—The other two species receive their designation from the peculiar form of organic disease of the lungs, invariably discovered, upon dissection after death, to be co-existent and connected with them: while the *catarrhal* is named merely from an exciting cause. Is Doctor Duncan certain that *catarrh*, in all cases, decides the origin, and influences the development, of this modification of pulmonary disease? Is he not also aware

that catarrh may, and does frequently, operate as an exciting cause of the tuberculous and apostematous forms of the malady under consideration? We have seen both these species pass on to the suppurative stage, even under the eye of wary, vigilant, and scientific observers, without violence or peculiarity of feature, calculated to excite a suspicion that any disease, except obstinate catarrh, was committing depredations upon the system.* In these views of the subject, the term, catarrhal phthisis, is then obviously inadmissible. They, who have contemplated, and learned rightly to appreciate, the influence which language exerts upon the progress and improvement of the sciences, will not consider our remarks on this subject, as

* A short narrative of the ensuing somewhat singular case, will serve to illustrate this assertion. A fine and most interesting young man, on his return from a voyage to the East, was labouring, for some months, under obscure, but not very urgent symptoms of pulmonary disease. He had a short, dry, cough; dyspnœa; feeble, quick, and regular pulse. The general health long continued very little impaired; but emaciation of the body was, at length, visible. We visited him but once. Upon examining the parietes of the thorax, we were surprised to find no pulsation in its left region. The heart was beating *regularly upon the right side of the thorax, about the greatest convexity of the fifth rib.* He declared that, some few weeks previously, he had "felt his heart move, on a sudden, from the left to the right side of his chest." We gave it as our opinion, that the situation of this organ had been changed, either by a great dilatation of its pulmonary cavities, or by an enormous accumulation of pus in the left cavity of the thorax. Shortly afterwards, we learned that there was a *pointing of the integuments in one of the lower intercostal spaces of the left side.* This determined at once the nature of the case. A medical gentleman, of great celebrity, consulted at this time, declared the case to be *aneurism of the aorta!* Emaciation and debility went on progressively increasing. One day, in the midst of an unusual severe paroxysm of coughing, something gave way within his chest; the bronchiæ were filled with an overwhelming deluge of *purulent matter*; and the poor young man perished from suffocation. We remember to have read, in the diffuse and incorrect work of Mr. John Bell, on "Anatomy," some remarks upon a similar change of situation of the heart, from a collection of pus in the thoracic cavities.

In the "*Traité de Splanchnologie*" of Gavard, a Parisian anatomist of celebrity, we meet with an interesting passage respecting pulsation of the heart in the right side of the thorax. This curious phenomenon was observed in four persons of the same family; upon dissection of three of whom, who died, *the right or pulmonary cavities of the heart were found greatly dilated.* "*Sur les trois autres,*" writes Gavard, "*dont on avoit ouvert le cadavre, ou avoit trouvé l'oreillette et le ventricule droits (du cœur) fort dilatés.*" We wish that the accurate work of Gavard, upon the anatomy of the various organs and viscera of the human body, were more generally known and read in these islands.

trifling, fastidious, or utterly unprofitable. To think correctly, and express ideas or convey instruction with clearness and precision, are auxiliaries more potent, more essential to the ultimate success of scientific investigation, than from a superficial view of the structure and operations of the human mind, we probably should be led to imagine.

Again, Is our author correct in the assertion, advanced in his Introduction, from which we have so largely quoted, that the "purulent matter," in catarrhal phthisis, "is merely separated from an inflamed surface, in a manner similar to the separation of pus from a blister-issue"? Perhaps, we do not accurately comprehend the term, *blister-issue*; but, if we really mean that, in the modification of the disease, designated by him catarrhal phthisis, the purulent secretion invariably, and *throughout the whole course* of such disease, takes place from the inflamed bronchial membrane, *without ulceration*, we have good ground to believe that he is mistaken. At all events, it may be considered a very questionable piece of doctrine; and such as, unless established by cautious and reiterated appeals to the scalpel, we can never consent to implicitly receive, even from the testimony of Doctor Duncan.

In the second chapter, "On the pneumonic symptoms occurring in the apostematous phthisis," Dr. Duncan appears, like other preceding writers upon this disease, to have fallen into important errors, and to have confounded two very distinctly-marked, and widely-differing, modifications of pulmonary consumption.

"One of the most frequent causes," observes our author, "from which an abscess in the chest derives its origin, is an hæmorrhage taking place from the lungs." Again, "In many instances, both active and passive hæmorrhage from the lungs, terminate in that species of inflammation which has been termed the suppurative; and this more frequently happens as a consequence of hæmorrhage from the lungs, than from any other part of the body." "Hæmoptysis, then, may justly be esteemed one of the chief causes, from which a large vomica or apostema in the lungs derives its origin."

Now, with all due respect for the elevated rank and character of the veteran professor, we candidly declare our opinion, that, in this train of argument, much incorrect observation and

unsound inference will, upon close inquiry, be detected. Suppuration does, indeed, sometimes succeed hæmorrhage from the lungs; but why? The answer, in our opinion, is obvious. Because that hæmorrhage, a process instituted by Nature, by the vital principle, or the *vis medicatrix*, as it has pleased some writers to designate it, has not been adequate to the purpose which it was designed to effect; not copious enough to completely remove that state of inflammatory action and congestion of the pulmonary organs, upon the uncontrolled progress of which suppuration must be inevitably consequent. We know not whether our meaning is expressed in terms sufficiently clear and intelligible.—To recapitulate. Inflammation of the respiratory organs, acute or chronic, takes place. Unless the concomitant increased action, and turgescence of the vessels, be speedily subdued, suppuration will, under circumstances favourable to its development, most probably ensue. To avert this impending danger, a process, salutary in its immediate effect, and less perilous in its remote consequences, is instituted by Nature. One of the loaded pulmonary vessels gives way; and hæmorrhage, to a certain extent, is the consequence. Now, this flow of blood is either adequate to the entire removal of the pulmonary affection, or it is not. In the latter case, the malady, after suffering an arrest of longer or shorter, often of momentary duration, hurries on with accelerated stride to its suppurative stage; and too commonly triumphs over all the vaunted resources of art. In the former, the result is various, and decided by circumstances, the influence of which our limited faculties can neither commonly discern nor correctly appreciate. Either the wound of the ruptured vessel may undergo the direct and fortunate process of reparation; may heal by what surgeons denominate the first intention; and the recovery of the patient be soon and firmly established: or ulceration, from the agency of unfavourable circumstances, may take place; and a species of phthisis, less intractable indeed by the resources of medicine, and less rapid in its progress to destruction, than the apostematous, become irrevocably confirmed. This modification, although, perhaps, as frequent of occurrence as the apostematous, and certainly, from our experience, more common, at least in South Britain, than the catarrhal form of pulmonary phthisis, is unnoticed by Dr. Duncan: and this

omission, assuredly, constitutes one of the prominent defects of his work.

From what has now been advanced, it will, we presume, appear obvious, that abscess of the lungs should not, indeed cannot, correctly be considered as the consequence of hæmoptysis. Vomica, in all cases where it has been preceded by pulmonary hæmorrhage, may, we believe, be more properly regarded as an effect of the uncontrolled agency and progress of that morbid state, for the removal of which the hæmorrhage has been instituted; but to the attainment of which object, whenever suppuration does take place, that hæmorrhage, either from its deficient quantity, or from some peculiar character or complication of the antagonist disease, has been utterly inadequate. We recollect rarely, if ever, to have seen copious hæmorrhage from the lungs, where pneumonia has terminated in suppuration. And, on the other hand, a vomica from idiopathic inflammation of the respiratory organs, we have more than once watched to its fatal termination, without any appearance of hæmoptysis, except those slight streaks of blood, issuing, probably, from a lesion of the minute vessels of the bronchial membrane; and almost immediately preceding the rupture of the parietes of the abscess, and the consequent effusion of its contents into the bronchial tubes.

Dr. Duncan, himself, in a somewhat indirect way, supports the train of reasoning, which we have thus boldly advanced, by an admission, that "hæmorrhage from the lungs, as well as from the nose, may sometimes be even salutary, *as removing a plethoric state.*"

Let us here pause for a moment, and apply to practice those reflections which a philosophic view of the phenomena and treatment of pneumonic inflammation is calculated to suggest. This digression from the direct road may not be without its uses. It may serve, in some degree, to support and illustrate the doctrines we have been attempting to establish.—A patient presents himself to the observation of his physician. He complains of fixed pain in the thoracic region; of hard, frequent cough, dry, or accompanied only by difficult or bloody expectoration. His respiration is distressed, and hurried; his constitution exhibits all the symptoms of the febrile state. What is the disease? Unequivocally, pneumonic inflammation!—What the

indications which offer themselves to the enlightened physician? Why, by a plan of depletion, and of abstinence from all sources of mental and bodily excitement, suited to the peculiar circumstances of the malady, he should attempt, not only to obviate the remote pernicious consequences, which must result from an unsubdued state of inflammation; but to render needless—to anticipate the salutary—but sometimes, from their excess, or from constitutional peculiarity of the patient, inordinate, or even dangerous exertions of the living principle, for the relief of the oppressed system. And with what certainty these objects may be accomplished by a vigorous adoption of depleting remedies, they, who reflect upon the energy and success of that medical practice, at present, commonly pursued in the treatment of acute diseases, throughout the British dominions, need not to be informed. Indeed, in such cases, where no morbid complication, no obscurity of symptoms exist, pathology and therapeutics may, in the hands of skilful and intrepid men, be brought nearly to the certainty and precision, which constitute the boast of mathematical science. We would recommend those, who invidiously, or from motives of interest, declaim against medicine as an useless and conjectural art, utterly destitute of any foundation upon the basis of truth or established principle, to ponder over these gratifying, and by no means infrequent occurrences in practice.

A description of the “pneumonic symptoms occurring in the tuberculous phthisis,” is delivered in the third chapter. These symptoms are delineated with our author’s accustomed fidelity; but on the long agitated question, whether the tubercles discovered in the persons, who have died of this modification of phthisis, be really organised, or merely inorganic substances; he, though evidently inclined to the former opinion, advances no conclusive reasoning or experiment. Perhaps, from its solution, no very obvious practical benefit would result. Yet, it must be allowed to constitute an interesting subject of inquiry.

We were speaking of that modification of phthisis, induced by rupture and consequent ulceration of a pulmonary vessel; and in the early stage of which, hæmoptysis forms the prominent feature. This is a species of the disease well known and described by medical writers, British and Continental. We mean not here that hæmoptysis, that scanty or irregular expecto-

toration of blood which frequently is observed in the suppurative stage of apostematous, and still more frequently of tuberculous, phthisis; and which, we believe, proceeds from some pulmonary vessel, laid open in the extension of the ulcerative process. To that distinct form of disease we allude, in which an usually plethoric person, upon some powerful excitement of mind, some excessive bodily exertion, or soon after the development of an active pulmonary affection, is seized with hæmorrhage from the lungs; and where, from indisposition of the ruptured vessel to the healthy process of reparation, or from frequent recurrence of the hæmorrhage, ulceration and secretion of purulent matter become firmly established. We merely resume the subject, to remark, that in this species of pulmonary disease, this *phthisis hæmoptoica* of some nosologists, there exists a very distinct variety, characterised by peculiar and uncommon symptoms, which we do not remember to have been noted by any medical writer, of past or present times. From anxious and attentive observation of the few cases, which have hitherto fallen under our notice, we are led to infer, that the variety in question is dependent upon, or complicated with, some morbid change of structure in the pulmonary cavities of the heart, or in the great arterial trunk, arising from them; but we have not yet been able to obtain that satisfactory demonstration of its real character and essence, which dissection would probably afford. At some future period, we hope to claim a share of the public attention, to this new and unexplored track of pathologic research.

The 4th chapter of Dr. Duncan's Work is principally occupied with "Observations on the Hectic Fever attending the second stage" of pulmonary phthisis. His conjectures on the origin of this fever are without novelty; neither striking nor conclusive. A minute description of the hectic paroxysm follows; and the conditions of the pulse, of the appetite, and various excretory functions, pass successively under review.

Our author, in the ensuing chapter, details the morbid phenomena which arise in the "last stage" of pulmonary consumption; or, "what may be termed the supervening or consequent symptoms." Here we shall merely pause to observe, that except in cases of strongly-marked apostematous phthisis, we have seldom or never seen, upon the tongue and mem-

brane of the mouth and fauces, those aphthous spots degenerating into ill-conditioned ulcers, which the doctor represents as common to every form of the disease; nor can we accord with him in ascribing their production to the action of the expectorated matter upon the mouth. We are more inclined to consider it an adventitious symptom, decided by peculiar circumstances of the pulmonic's case or constitution; and dependent for its origin, on a *remote* sympathy with the morbid state of the bronchial membrane, or derangement of the alimentary canal.

But there is one symptom which frequently shows itself towards the fatal close of pulmonary phthisis; not noticed by Dr. Duncan, or, as far as our knowledge and recollection extend, by any other writer on this disease. The symptom to which we allude, is pain, affecting the integuments of the sacral extremity, somewhere in the vicinity of the internal malleolus; and probably implicating the minute branches of that division of the *anterior* crural nerve, destined to accompany the greater vena saphena. It is commonly abrupt in its accession, fixed, circumscribed, and intense; peculiar, if we mistake not, to the tuberculous form of pulmonary consumption. In one instance only have we seen it invading the centre of the gastrocnemius muscle. From its violence and intractability, it is alike distressing. We have never known it yield completely to the resources of medicine; it commonly declines as the shades of death deepen around the unhappy sufferer. Hot fomentations, and the vigorous topical and internal employment of opium, seem to exert a palliative but transient influence upon this tormenting symptom. It may, probably, be attributed, like many other inexplicable phenomena of disease, to some mysterious sympathy with the distant site of morbid operations, which the knife of dissection, and the brain of theory will, we presume, be equally inadequate to develop or explain.

The sixth chapter is devoted to a consideration "of the diagnosis in phthisis pulmonalis." After detailing in a very clear and masterly style, the principal symptoms which serve to distinguish pulmonary consumption from other diseases, with which it might possibly be confounded, and the three peculiar forms of that malady from each other, Doctor Duncan concludes thus:

“ From due attention to those diagnostics which have now been pointed out, pulmonary consumption may be most readily distinguished from other diseases; and when it does occur, the three different species which have been pointed out may be more readily distinguished from each other.”

Now this sentence looks well upon paper, and would, perhaps, have an imposing effect when delivered with due solemnity and deliberation from the professorial chair. Yet we entertain great doubt whether this facility of diagnosis in phthical diseases, will not too often, phantom-like, disappear, when, at the bed-side of the dying pulmonic, an effort is made to grasp it. Experience tells us that it will. Did Dr. Duncan, ere that unguarded sentence escaped from his pen, recollect that, by the majority of sufferers from pulmonary maladies, the aid of medicine is seldom sought ere their first stage, that stage in which alone correct discrimination is commonly practicable, has reached its close? Ignorance, inattention, poverty, the occupations of busy—or the pleasures of fashionable life, in general, favour this fatal spirit of procrastination. Has a keen and veteran observer of the human character, like Dr. Duncan, need to be reminded that, in gleaning from a patient the history of early symptoms, the medical inquirer is often perplexed, or lamentably led astray, by the carelessness, stupidity, or affectations; by the whims or prejudices; by the studied and artful misrepresentations of the sick; or by the irreconcilable statements of anxious or interested relatives? Has he yet to be told of the countless shades and variations, which, from the influence of the pursuits and passions, of peculiar physical structure, of local circumstances and situation, phthisis, like all the other morbid affections of man's perishable organs, is, in any individual case, prone to assume?—Surely not.—Is he, lastly, not aware that two, perhaps even more, of the peculiar forms of organic lesion essentially connected with—and inducing—the various modifications of pulmonary phthisis, now under discussion, may exist in the lungs of an individual at the same time? Instances of this kind are scattered through the pathologic writings of past and present days. For one case, exactly in point, we refer our readers to the recent publication of Doctor Watt on chincough. Vomica, and tubercles in a state of suppuration, were seen existing in the

respiratory organs of a child, whose body was examined by that very zealous and enterprising man.*

If these observations have any foundation in truth, what then becomes of Dr. Duncan's facility of diagnosis? By a physician, enjoying his opportunities of instruction and research, and grown gray in the contemplation of diseases, this invaluable talent may, doubtless, have been acquired; but to the coarser perceptions of ordinary men, such happy powers of delicate and correct discrimination are, we well know, almost universally denied.

Upon this subject we pause, to comment with some earnestness; convinced that mischief, rather than good, must result from such statements, implicitly received and confided in.—What, we would ask, can be more likely to excite inquietude and disgust in the human mind, than a sense of inferiority to other men engaged in similar studies and pursuits? or, what calculated more effectually to awaken this painful and humiliating consciousness, than representations like that, upon which we now feel ourselves called to animadvert? Relying upon his powers of discrimination, which he has been told that it is a very easy business to acquire, the young and inexperienced physician hurries to the chamber of his patient; upon his anxious queries, a perplexing and contradictory “tale of symptoms” is unfolded: doubt and obscurity envelop the disease; the fair delusion vanishes; confusion and discouragement take possession of the inquirer's mind. From frequent repetition of his difficulties and discomfiture, he becomes timid and distrustful. First impressions are not easily obliterated: and he may lose, perhaps irrevocably, that self-possession and confidence essential to the physician's success. Nay, he may even quit in disgust, for some less sterile field of science, a path of study which his talents, properly directed on the onset, might have enabled him to explore with signal honour and reputation to himself, and benefit to his fellow-creatures. We have ever been led to consider—we have invariably found—the diagnosis of diseases a branch of practical medicine more difficult, and requiring, for its successful cultiva-

* See our critique on Dr. Watt's book, at page 169 of the 7th volume of this Journal.

tion, greater skill, and patience, and delicacy, than any other. In fine, the mind of man, in whatever path of science or labour it be engaged, will, we are persuaded, be only stimulated to more vigorous and steady exertion by a correct survey of the difficulties opposed to its progress; while, from an occurrence of unexpected obstacles, for which it has never been duly prepared, nothing but chagrin, indifference or disgust, can, sooner or later, be expected to accrue.

“Observations on the general plan of cure in pulmonary consumptions,” form the subject of our author’s seventh chapter.—Occupied here with the leading indications of cure, which present themselves in the apostematous form of pulmonary phthisis, Dr. Duncan remarks:

“In this species of phthisis then it must be evident, that a first and principal object is to discharge that purulent matter which is collected in the apostema. For accomplishing this, when the cyst remains entire, the first requisite is, that it should be ruptured; and for this purpose, measures may sometimes be advantageously employed by the physician; such, for example, as concussion of the system by the action of vomiting, of coughing, or the like.”

On the soundness of this doctrine, or general expedience and advantages of the practical conduct which it is calculated to suggest, our minds, however, have not come to any decisive or satisfactory conclusion. The proximate cause of hectic fever, like that of the other phenomena exhibited by the living system in health and in disease, has hitherto baffled every effort of human genius for its discovery. Yet an opinion has gone abroad, and we are far from considering it destitute of plausibility, that this fever does not invariably or indiscriminately arise from the mere absorption of purulent matter into the system, but from its introduction only, when, from the influence of exposure to atmospheric air, or other unknown and inexplicable change, certain noxious qualities have been acquired by it.

Upon this intricate question, we presume not positively to decide. But, however it be, we have certainly seen large collections of pus deposited in the vicinity of the psoas muscle, or other parts of the body; and, after remaining a considerable time, eventually removed by the process of absorption, without inducing in the system the phenomena and ravages of hectic

fever: and in a case of abscess of the lungs, however considerable, we have reason to believe, that the peculiar and distinctive features of this morbid state are rarely or never developed, until purulent expectoration has been decidedly established. Complete absorption of pus from a large pulmonary abscess, the efforts of Nature, or resources of art, are, we apprehend, seldom adequate to accomplish; yet by the bare possibility of an occurrence, thus fortunate, we are surely warranted to regard the attempt to procure it as our *first indication* in the treatment of such disease. Preparations of quicksilver, foxglove, counter-irritation established in the vicinity of the purulent deposit, offer, perhaps, in this view, the fairest prospects of success. It should be recollected, that by the rupture of a vomica, even under circumstances the least inauspicious, a patient is unavoidably brought into a situation of pressing danger.

To the interesting subject of tuberculous phthisis, as connected with morbid enlargement of the mesenteric glands, not the slightest allusion is made by Dr. Duncan. This is surely an inexplicable omission; and may be justly pronounced to constitute another very striking defect in the outline and execution of his work.

That a morbid condition of the mesentery and the tubercular modification of pulmonary consumption are frequently complicated in the same individual; that the phenomena, peculiar to these forms of thoracic and abdominal disease, do clearly and conspicuously alternate with each other; are facts as firmly established on the basis of correct observation, as any with which the science of medicine is enriched. We need only watch with sedulous eye the varying features of tubercular consumption, to be convinced of the one; or examine the lungs and mesentery of a few deceased pulmonics, to obtain satisfactory demonstration of the other. Now, by some physicians of great experience, and high practical authority, it is contended, that the tubercular disease of the pulmonary organs is ever and invariably complicated with, and in fact, should be regarded as a consequence of, the mesenteric affection. These doctrines involve many and most important questions; we shall, therefore, pause for a while, to examine the validity of the ground on which they rest. In the first place we may remark, that disease of the mesenteric glands has frequently existed

long in its most dire and destructive form, where no disorder of the pulmonary organs was observed during life, nor the slightest deviation from their natural structure detected after death. Secondly, In the abdomen of subjects, who have perished from tubercular phthisis, alike severe and protracted, vestiges of morbid alteration have frequently been sought for in vain. For the accuracy of these assertions, we might appeal to many a long and lonely dissection, which the hand, now inditing them, has performed. How far they serve to invalidate the the correctness of the proposition by which they have been provoked, it is needless to expose.

Again, in the phenomena of diseased action, as in all the operations displayed upon the great theatre of the universe, the link which connects the successive changes is generally so delicate, so difficult of detection by our coarse and imperfect organs, that we have no means of estimating with precision their mutual relations, or the influence which one must essentially exercise on the production of another. Nor, even where one change or one set of phenomena invariably succeeds another, is it necessary to infer that the last in order is dependent solely for its existence on that which precedes it; or, in other words, that they should be beheld in the absolute relation of cause and consequence. But we have shown, that disease of the mesentery, however long established, is not always followed by a tuberculated state of the lungs: and, on the other hand, that the pulmonary affection may assume its most aggravated and fatal aspect, without having been, in the slightest degree, preceded by the abdominal malady. The application of this reasoning to our argument is at once striking and correct; its hostility to the opinions we are assailing, equally obvious and decided.

Moreover, were tubercular phthisis, in all cases, dependent on a pre-existing state of mesenteric disease, the pulmonary affection should surely yield, if not wholly, at least in some degree, to the remedies which are employed with success to palliate or remove its cause. This, according to our experience, is not the case. A patient presents himself to us, in whom these forms of thoracic and abdominal disease are obviously complicated. We succeed, by the employment of the appropriate remedies, in relieving the pain, and tension, and irritation

characteristic of the latter; but the peculiar and more formidable features of the pulmonary affection are commonly, in a proportionate degree, aggravated. Palliate the latter, and the mesenteric symptoms will soon resume their original preponderance and intensity. How little does the remarkable propensity of these diseases to alternation bespeak the influence of those laws which are generally observed to regulate the operations of cause upon effect, and decide the obedience of the latter to the impulses of the former.

Lastly, it is certain, we repeat, that in many cases of tubercular consumption, mesenteric disease does exist, or has previously existed. But, perhaps, in all such cases, it will be most consonant to sound observation and correct reasoning, most useful in the views and decisions of practice, to behold them, not in the relation of cause and effect, but as the co-existing consequences of one common and yet unknown morbid agent. We cannot refrain from an expression of surprise, that to a man, possessing Dr. Duncan's field of inquiry and talent for discrimination, the experience of "more than half a century" should not have suggested some views, however faint or limited, of this striking and momentous connection between pulmonary and mesenteric diseases.

The eighth and concluding chapter presents our author's "Observations on particular practices employed in Phthisis Pulmonalis." These are extended to very considerable length; and our strictures have already so far transgressed the limits of ordinary criticism, that we must not allow ourselves to enter into any particular comments upon them. Among the more important remedies in this disease, he considers venesection; blisters and issues; emetics; refrigerants, as the vegetable acids and nitrate of potass; digitalis; milk diet; sea voyages; the bark of cinchona; vegetable balsams; myrrh; mercury; sarsaparilla; mezereon; tussilago farfara; lichen islandicus; conium; mineral water; and pneumatic medicines. Of all these he treats in succession: and the relative merits of each, and their correct applicability to peculiar circumstances of the disease, appear to us to have been appreciated and pointed out, by Dr. Duncan, with no common share of acuteness, accuracy, and candour.—He thinks favorably of the effect of inhaling the vapour of sulphuric ether, in which the dried leaves of *conium maculatum*

have been macerated; and recommends it as “ particularly relieving the cough and dyspnœa and promoting expectoration.” This we would particularly impress on the recollection of our readers. To palliate the pangs of human suffering, and soften the severer features of irritation and distress, form to the benevolent mind a grateful but melancholy office; and unhappily too often, in phthisical maladies, the only one which the physician can hope to undertake with success.

We perfectly coincide with Dr. Duncan in his opinion that counter-irritation may be more successfully employed against catarrhal, than any other form of pulmonary phthisis. But experience has taught us, that blisters, kept open only for a few days, are utterly inadequate to remove that ulceration of the bronchial membrane, upon which we believe the external phenomena of this modification of the disease to be essentially dependent. The process of purulent secretion should be permanently established from a large ulcerated surface, on the parietes of the thorax; and its operation may, we suspect, be greatly promoted by a full but cautious introduction of mercury into the pulmoniac’s system. Catarrhal phthisis, it should seem, is the only species of pulmonary disease, in which, after purulent expectoration has been established, that powerful medicine, except in a very mild and alterative form, can be successfully, or even safely, prescribed.

Some valuable remarks on the regimen and exercise of phthisical sufferers, and on the best mode of palliating the more distressing symptoms by which they are harassed towards the close of the disease, terminate the chapter. We beg leave to recommend them to the attention of our readers.

From an Appendix, on the preparation of a soporific medicine from the common garden lettuce, which, it seems, is printed in the first volume of the Memoirs of the Caledonian Horticultural Society, we shall quote at considerable length. Dr. Duncan has prepared from this plant a narcotic, which he considers little inferior to opium in its soothing powers, and exempt from many inconveniences by which the exhibition of the valuable product of the poppy is frequently attended. This is an important communication. A knowledge of it cannot be too soon or too generally diffused, so that the Doctor’s opinions respecting his *lactucarium* may be brought to the test of experiment.

“ It has been the opinion of many, that all the milky juices spontaneously exuding from wounded vegetables, possess somewhat of the same sedative power with the milky juice of the poppy. Few plants in Britain afford such milky juice more copiously than the common garden lettuce, the *lactuca sativa* of Linnæus; and every one must have observed, that this juice, when spontaneously inspissated by the heat of the sun on the wounded plant, soon assumes the dark colour of opium, while at the same time it possesses in a high degree the peculiar, and I may say, specific taste which distinguishes that substance. And beside this, it is a well known fact, that lettuce was much used by the ancients as a soporific.

“ These circumstances led me to turn my thoughts on some method of collecting and preparing this substance, that I might try its effects in the practice of medicine; and after several trials of different modes of preparation, what I shall now briefly describe are the best methods I have yet been able to discover.

“ I dedicated to this experiment, in my garden at St. Leonard’s Hill, near Edinburgh, a small bed of that variety of lettuce which is commonly known among gardeners by the name of *ice lettuce*. I allowed the plants, about a hundred in number, to shoot up till the top of the stem was about a foot above the surface of the ground. I then cut off about an inch from the top of each. The milky juice immediately began to rise above the wounded surface. Though then of a white appearance, it had next day formed a black or dark-coloured incrustation over the surface where the stem was cut off. I found it impossible to separate this by scraping, as is done with the milky juice exuding from the head of the poppy, when it has assumed the form of opium; I therefore cut off with a sharp knife a thin cross slice of the stem, to which the whole of the dark-coloured opium-like matter adhered. This was thrown into a wide mouthed phial, about half filled with weak spirit of wine, the *alcohol dilutum* of the *Edinburgh Pharmacopœia*, formed of equal parts of rectified spirit and water. By this menstruum, the whole black incrustation on the thin slice of the stalk was dissolved, and the spirit, as may be readily concluded, obtained both the colour and taste of the black incrustation.

“ Each of my plants, in consequence of the fresh wound inflicted by the removal of the thin cross slice, afforded a fresh

incrustation every day. And by throwing these into the phial, I soon obtained what I concluded to be a saturated solution of the exudation from the lettuce, or rather of the milky juice in its inspissated state. It was then strained off, to separate the pure solution completely from the thin slices of the stalk. To this strained spirit, which had nearly both the appearance and taste of the ordinary *laudanum* of the shops, I have given the name of *solutio spirituosa succi spissati lactucae*. From trials made with this solution, both on myself and others, I have no doubt that it is a powerful soporific. But to obtain a form, in which it might be exhibited with greater certainty as to the dose, I evaporated the spirit, and thus brought the residuum to a dry state. In this state, it has very much the appearance of the opium imported into Britain, particularly of that which is imported from Bengal, and which is a much softer substance than the Turkey opium. To this *opium-like* substance, I have given the name of *lactucarium*; and from some trials which I have made with it, when exhibited under the form of pills, it appears to me to be little inferior in soporific power to the opium which is brought from Bengal.

“From the *lactucarium* thus obtained, I have formed a tincture, by dissolving it to the extent of one ounce in twelve ounces of weak spirit, which is the proportion of the opium to the spirit, in the *liquid laudanum* of the Edinburgh College. To this formula I have given the name of *tinctura lactucarii*. I consider it the best formula I have yet been able to contrive for obtaining the soporific and sedative powers of the *lactuca sativa*; and in different cases I have, I think, seen manifest good effects from it, both as inducing sleep, allaying muscular action, and alleviating pain, the three great qualities of opium, which *demonstrate* it to be one of the most powerful sedatives. At present, however, I intend nothing more but to communicate to the Caledonian Horticultural Society, a method of preparing a soporific medicine from common lettuce. For ascertaining more fully its medicinal effects, I am at present engaged in a series of trials, which may, perhaps, be likewise communicated to them.

In perusing this publication, we have met with some opinions expressed by Dr. Duncan, which we cannot, without a mean dereliction of our principles and professions, suffer to

pass unnoticed. And against their promulgation from such a source, too prevalent as they already are among medical men, we solemnly and earnestly protest.

Towards the close of the eighth chapter, our author, speaking of the necessity of a due regulation of the passions, in subjects suffering from pulmonary disease, has this observation:—
“At the same time, it is equally necessary to avoid what will depress the patient; *and even where there is very faint expectation of recovery, the chance of such an event will be diminished, by endeavouring to make the patient fully sensible of his own danger.*”

From Scotland, where religion, at least in its external forms, is established and observed with uncommon purity and strictness, and where, consequently, it may be hoped that infidelity has not yet shed, as among the children of the “more polished and enlightened south,” her pestilential influence: from a man fast journeying, as Dr. Duncan must now be, to the “tomb of his fathers,” we did not expect to hear doctrines like these openly disseminated. And we do hope that, should another edition of his work be called for, he will so far humour the “absurd prejudices” of us infatuated reviewers, as to alter or expunge this obnoxious passage.

By some, whose eye may glance over our perishable page, it will perhaps be thought, that the opinions of the venerable writer before us, have been criticized with a freedom and asperity ill-suited to his years, his character, and situation; and that, neglecting the peculiar excellencies of his work, we have confined ourselves to the invidious task of raking up, and exposing, real or imaginary errors. To these accusations, if such be preferred against us, our reply is brief, we trust, demonstrative of their futility: Criticism respects not the distinctions of rank, or title, or reputation; truth is the object of her researches. Anxious in its pursuit, she regards, with indifference or contempt, every minor consideration, which may arise upon her stern and rugged path. Again, the real excellencies of the productions of art, as those of nature’s boundless domain, shine with a native and intrinsic lustre. Obtrusive on every passing eye, little hesitation or sagacity is requisite to descry them. Eulogy heightens not their value, nor can ignorance and prejudice permanently sully or obscure it. But to detect error under

its most specious disguise; to separate it from the sterling gold of truth; to strip from its surface the tinsel gloss, with which, by the alchemic touch of genius, by the influence of character, or the graces of a polished and commanding style, it may have been invested, is a delicate and laborious process; requiring, for its successful execution, all the concentrated powers of the human mind. For this department of science, criticism was instituted. Upon her hand this arduous process devolves; and, by its results, the merits and utility of her individual labours must be eventually determined. Lastly, we deem it an imperious duty to examine, with redoubled rigor and circumspection, doctrines promulgated by the aged or eminent of our art. Error, stamped with the name and authority of a Duncan, must prove, in its consequences, peculiarly pernicious; because every where received and propagated with peculiar confidence and celerity.

Viewed in one light, this little volume may convey an instructive lesson, *pregnant to the diffident yet aspiring heart with consolation and encouragement*. To charm by the splendour, to strike with the novelty, or astonish by the magnificence of its views, are the exclusive attributes of genius; but how successfully a mind of even common powers and cultivation may, under proper impulse and direction, be exerted; how essentially contribute to the honour and interests of any science, upon which its energies are employed, the perusal of these pages will incontestably demonstrate.

In fact, we know not whether in a science, like that of medicine, which admits only of being improved by the slow processes of rigid observation and of cautious induction from facts, genius, impatient of toil, and soaring above restraint, be pre-eminently calculated to excel. An appeal to the historic records of that science, will justify inferences decidedly opposite. To men possessing patience, industry, unwearied application, invincible firmness, and all the more solid and sterling qualities of the human mind—qualities rarely implanted in the fervid and volatile bosom of genius; to a Bonetus, a Morgagni, a Lieutaud, and a Baillie, medicine is principally indebted for her present state of culture and exaltation: and certain it is, that one faithfully recorded history of disease, illustrated by minute dissection, is, when poised in the scale of practical

utility, worth a bulky quarto of ingenious speculation, decorated with all the dazzling but evanescent splendours of a Darwin's intellect.

And we, while kings, and statesmen, and conquerors, attract the gaze and the acclamations of an admiring multitude, gladly turn aside from the passing pageant, to contemplate human excellence in its purer, though less splendid and imposing garb; and offer our feeble tribute of veneration to the man, who, after a long life honourably devoted to the culture of a beneficent art, shall descend to his grave (and far from that grave be the venerable Dr. Duncan yet removed), amid the lamentations of that science, and the benedictions and regret of that community, which he has so signally benefited and adorned.

BIOGRAPHY.

*Biographical Memoir of the late Henry Reeve, M. D. F. R. S. of
Norwich.*

[From the Edinburgh Medical and Surgical Journal, for April, 1815.]

IT would be an act of injustice to the memory of our late estimable friend and colleague, were we to permit another number of this journal to appear, unaccompanied by some memorial of his talents and worth, some public testimony of our sincere and deep regret for his premature loss. In attempting to detail the incidents of his short but active life, we shall probably, indeed, incur the imputation of standing forward as the partial eulogists, rather than as the unbiassed biographers of our friend. But we know not how to avoid such an imputation, where simple description will be construed into eulogy. To review the career of those individuals, whose moral excellence and intellectual endowments have been conspicuous in every situation in which they were placed, tends to elevate our views of the human character; and the task, though melancholy, cannot be devoid of interest and improvement.

Henry Reeve was born, in the year 1780, at Hadleigh, in Suffolk, in the vicinity of which his father is in possession of considerable property. After having received the usual preliminary instruction, he was sent, at the age of nine, to a school of great reputation at Dedham, in Essex, under the care of Dr. Grimwood, where he entered for the first time upon the study of Latin. Possessing an excellent memory, and uniting great diligence with quickness of apprehension, he made an uniform and rapid progress in this new department of study, and out-stripped most of his contemporaries in his classical acquirements; nevertheless, though his acknowledged superiority necessarily raised him to the favour of the master, yet his affability and benevolence, so characteristic of his disposition in after-life, averted all envy, and secured him the esteem and attachment of his school-fellows. Many an exercise, indeed, was shown up by the indolent or less expert boys, which he had penned in addition to his own. Yet with these habits

of industry, he united great activity in the ordinary exercises of school-boys, was distinguished as a cricket-player, and took the lead in some other active pursuits. On one occasion, especially, when an alarm reached the school-room, that a boy had fallen into the river, and was in danger of being drowned, Reeve was the first to reach the brink, and to plunge, at the hazard of his own life, to the rescue of his school-fellow. The confidence which his worthy preceptor placed in the steadiness and humanity of young Reeve, induced him to place under his immediate care an only child, of delicate habit, who was sent to Dedham, at a very early age, and who found a kind protector, as well as a tutor, in his new friend. The success with which Reeve cultivated classical literature, and especially the Latin language, was very considerable, for he subsequently wrote that language with fluency and elegance; of which his thesis, and especially his dedication to Mr. Martineau, affords abundant evidence; the point and neatness of the expression in the latter, as well as the sentiments which it contains, were, indeed, highly creditable to his taste and feeling. In addition to his love of the classics, he evinced, while at school, much of that disposition to the examination of natural objects, and to the pursuits of agriculture, which subsequently occupied his attention; and he was sometimes found by his school-fellows when at their play, employing himself in the dissection of a bird or a mouse.

This propensity to the investigation of nature, probably determined his choice of the medical profession; and, on quitting school in the year 1796, he was placed with Mr. Martineau, a surgeon of great ability and reputation, at Norwich. Under such a preceptor, who ever retained his warmest esteem and attachment, his assiduity, his zealous spirit of inquiry, and his facility in the acquisition of the objects of his pursuit, could not fail to procure for him a store of fundamental knowledge in his profession, which the earlier studies of the art rarely afford. Accordingly, after passing four years in circumstances thus favourable to his improvement, he went to the university of Edinburgh, in the autumn of 1800, much farther advanced in medical and surgical knowledge, and better prepared to profit by the course of academical studies, which he was about to commence, than the generality of students who repair thither.

During the three years, which are required by the statutes of the university, to be dedicated to study by those who graduate there, he was assiduous in his attendance on the different lectures appertaining to his profession, and was led, by his general love of science, to extend his exertions in this way beyond the bounds prescribed by the university to the students of medicine. Thus, in his first year, he attended the valuable course on Natural Philosophy, delivered by professor Robinson; in his second, the interesting and eloquent course of professor Dugald Stewart, on the subject of Ethics; and, in his third year, he not only became a pupil of Dr. Barclay, for the sake of more minute anatomical research than the college then afforded, and of Mr. Allen, whose able and elegant course on the subject of Animal Economy was the select resort of the most ingenious and zealous among the students;—but he also attended, with great assiduity, the lectures of professor Coventry, on Agriculture and Rural Economy.

Within the pale of the college, no distinctions are conferred to stimulate industry or to reward merit. The individual who can barely struggle through the ordeal of his final examinations, and he who passes the most rigorous trial with facility, and with an exuberant display of knowledge, equally receive the common degree. Nevertheless, there are, annexed to the system of education at Edinburgh, sources of distinction, and therefore of emulation, not the less calculated to call forth the energies of the students, because they originate and exist exclusively among themselves. In the societies, at which the most respectable of the students meet weekly, for the discussion of scientific topics, the zeal and industry of the members are excited, not only by the prospect of reputation, in consequence of the display of extensive information and ingenuity in the debates, but by the hope of attaining the power and dignities of office, especially of the presidential chair, which are conferred annually on four of the most distinguished members, by their own free ballot. The value, which is attached to these truly honourable stations, may be estimated by the constant exhibition of the titles in the front of the inaugural dissertations. Mr. Reeve having joined the Royal Medical Society, entered at once into the discussions which were carrying on, displaying an intelligence and facility of elocution, unusual in so

young a member, and in one unaccustomed to speak in a public assembly. The modesty and mildness of his demeanour, his knowledge of the subject, and the flashes of humour with which he enlivened the gravity of debate, contributed also to obtain for him the early esteem of the members; and in the following year, the second only of his residence at Edinburgh, he was elected to a seat in the presidential chair,—an honour seldom obtained before the third year. He was also elected to the same honourable office, the following year, in a smaller society instituted for the investigation of natural history. His attachment to free discussion, induced him also to become a member of the “*Speculative Society*,” established in the college for the cultivation of eloquence,—a society in which many of the rising ornaments of the senate and of the bar at that time exercised their early talents.

In June, 1803, he terminated his active and honourable career at Edinburgh, by taking the degree of doctor of physic; on which occasion he evinced his continued inclination to the study of natural phenomena, by selecting for the subject of his inaugural thesis, the nature and causes of the torpidity of hibernating animals. The title of his essay was “*Disputatio inaug. de Animalibus Hyeme Sopitis*.” We have already alluded to the peculiar neatness of the Latinity, with which his facilities of composition in that language enabled him to clothe this dissertation; and to the good taste and honourable feeling exhibited in the dedication to his much esteemed preceptor, Mr. Martineau. Of the contents of this essay, as he subsequently republished it in another form, we shall have occasion to speak hereafter.

Having quitted Edinburgh, Dr. Reeve spent the greater part of the two ensuing winters and of the year 1804 in London, for the purpose of extending his professional knowledge, both by learning the opinions of different practitioners, in a new field of inquiry, and by multiplying his own observations among the multitude of maladies, which the various population, and the central attraction of the metropolis, necessarily bring under view. Here he became a diligent attendant on a large hospital, and also on some of the lectures delivered by eminent teachers. He was likewise admitted a member of the Medical Society of London, which holds its meetings in Bolt

Court, Fleet Street, and which was at that time the only society in the metropolis, in which the opinions of any of the established practitioners could be heard. He attended its weekly meetings, and, as was his custom, entered actively into the interchange of information, which it was the object of the institution to promote. During this year, while he was half-determined to fix his residence in London, he had meditated, together with one of his fellow students, settled in the metropolis, on the want of a good periodical journal, which, by appearing quarterly, might command a sufficient quantity of valuable materials, to be more uniformly interesting than the only monthly medical journal then existing; and Dr. Reeve had himself drawn up a *prospectus* of this projected work. At the same moment, however, Dr. Duncan, junior, had formed the design of the Edinburgh Medical and Surgical Journal, upon the same plan, and had taken some steps for its commencement; but, having heard of the intention of his two friends, he communicated his proceedings to them, and suggested the mutual advantages which might result from uniting their labours,—a proposal to which the latter immediately acceded. Dr. Reeve continued, as long as his health permitted the exertion, to give his valuable aid, in various communications, to which we shall have occasion to allude, as well as in the supply of a considerable share of the anonymous criticism.

During his residence at Edinburgh, Dr. Reeve had formed a most intimate friendship with Mr. now Dr. De Roches, a fellow-student from Geneva, of an amiable disposition and considerable talents, who, after his graduation, also continued his medical studies in London. This gentleman being about to return home, in the spring of 1805, Dr. Reeve determined to accompany him, for the purpose of visiting as many of the interesting countries of the continent, as were not rendered inaccessible by the occupation of the French armies. They embarked at Harwich, and having landed at Husum, were compelled, by the presence of the French in the Electorate of Hanover, to go northward, by Lubec, to Magdeburg, whence they travelled through Halle, Leipsic, Weimar, Frankfort, &c. into Switzerland. In the three first places they spent some time, examining the anatomical museum of Loder, and visiting professors Reil, Sprengel, Gilbert, Kuhn, and other learned

men. In about six weeks they reached Neufchatel, which, being then under the protection of the king of Prussia, afforded a safe asylum to an English traveller. Here Dr. Reeve remained two months alone, with the view of perfecting himself in the French language, and his friend proceeded to Geneva. Here he seems, in consequence of his solitude in a foreign country, to have had a slight degree of the *maladie du pays*, and to have suffered, perhaps for the only time in his life, a considerable depression of spirits; for on his return, at the expiration of two months, Dr. De Roches found him pale and thin, and disposed to avoid society and cheerful occupations. The company of his friend, and the commencement of a tour, speedily restored him to his usual hilarity and health. They visited Berne together, and examined its hospitals, of which Dr. Reeve published an account in the fifth volume of this Journal.* He was much delighted with a national festival, in one of the most romantic spots of Switzerland, near Interlacken, which was called the *Fête des Bergers*, and at which all the athletic feats of the Swiss peasantry became the subjects of contests and prizes. From thence, under the protection of a little pardonable *ruse de guerre*, he ventured to accompany his friend to Geneva, as an American. His stay, however, was necessarily short, and with much regret on the part of Dr. De Roches and his family, they once more separated. Dr. Reeve now hastened, in consequence of the advancing season, to the glaciers of Chamouny, and thence passed through many interesting scenes in the Valais and petits cantons, by Zurich, Baden, and Basle, to Schaffhausen; whence he proceeded by Munich to Ratisbon, where he embarked upon the Danube, and made the voyage to Vienna.

During this part of his journey in Switzerland, his attention was attracted to the celebrated baths of Leuk, in the Valais, and he published, through the medium of this Journal,† an interesting account of the springs which supply them, and of the surrounding country; describing also the temperature of the baths, the mode of bathing, and the effects of the operation, as well as the diseases which are said to be remedied by resort-

* Edinburgh Medical and Surgical Journal, Vol. V. p. 253.

† Vol. III. p. 150.

ing thither. In the course of the same journey, his inquiries were directed to the nature of that singular condition of the human economy, which characterizes the Cretins; and he obtained drawings of the skull of one of these unfortunate beings, which he brought to England, and laid before the Royal Society, accompanied by a brief memoir on the subject.* He likewise contributed to this Journal an interesting communication on the same subject, under the title of "Some Account of Cretinism," which was illustrated by two sketches of the skull.† He ascertained that there is no necessary connection between the *goitre*, or tumour of the thyroid gland, and Cretinism; nor between either of these diseases and the use of snow-water: but he was disposed to ascribe the disease of the Cretin to the same causes, to which a somewhat analogous malady, the rickets, appears to have owed its origin in this country; namely, bad air, unwholesome food, want of cleanliness, &c.

On reaching Vienna, he determined, in consequence of the disturbed state of the Continent, to make that metropolis his place of residence for the winter. This determination, however, compelled him to break an engagement, into which he had entered previous to his departure from London. During his short stay there, his zeal and information had become so far the object of notoriety, that he was solicited to deliver a course of lectures at the Royal Institution, "on the moral and physical history of man;" and his name was actually announced by the committee among the lecturers of that year.

His residence at Vienna, during the winter of 1805, was the source of much interest; as he not only obtained an extensive introduction to various persons of rank and eminence, but remained there during the occupation of that metropolis by the French, after the defeat of General Mack, and had frequent intercourse with the medical and other officers of the French army. The German language was a leading object of his attention while at Vienna, and he cultivated it with considerable success. A knowledge of this language indeed has become highly important to the medical philosopher, since it has been enriched by the writings of Blumenbach, Reil, Richter, Spreng-

* See Philosophical Transactions, Vol.

† See Edinburgh Medical and Surgical Journal, Vol. V. p. 31.

gel, and many other able physiologists and physicians. He likewise availed himself of the opportunity, which a winter at Vienna presented, of prosecuting his researches in regard to the phenomena of torpidity: and for this purpose he kept several marmots, and a hamster, at his lodgings, carefully investigating the state and changes of the functions in these hibernating animals. Several communications to the newly established Edinburgh Medical and Surgical Journal were the result of his observations at Vienna; particularly, an account of the state of Vaccination on the Continent, including a statement drawn up at his request by Dr. De Carro;*—two papers, descriptive of the general hospital, and the school of medicine at Vienna;†—and an “Inquirer,” respecting the then state of medical science in Germany.‡

Dr. Reeve quitted Vienna early in the spring of 1806, and visited Prague, Dresden, and several other cities, which offered objects worthy of attention. At Berlin he remained for some time, having been introduced to the principal literati and other persons of distinction, and embraced the opportunities, which were afforded him, of examining the state of medicine and science in that metropolis. The result of this investigation was briefly detailed in the Edinburgh Journal, together with a list of the diseases which had occurred in the great hospital there, for the space of four years.§ Still obliged by the state of continental affairs to pursue a northern course, he went from Berlin to Hamburgh, and thence to Cruxhaven, where he embarked for England.

For some time after his return, Dr. Reeve was undecided as to the place where he should finally settle to practise his profession, balancing especially between London and Norwich. The metropolis, as the great centre of learning, science and wealth, presents many attractions to a professional man of liberal education. It opens before him a wide field for honourable ambition; it abounds with intelligent and polished society; and its very magnitude deprives professional competition of all its personal jealousy and enmity. The road to practice, therefore,

* Vol II. p. 126. † Ibid, p. 491, and Vol. III. p. 122. ‡ Vol. IV. p. 69.

§ See Some Account of the Medical Topography of Berlin, Vol. II. p. 376.

appears to be both broad and smooth, in comparison with provincial situations. But having weighed, on the other hand, the extreme uncertainty of ultimate success, and the necessarily long period which must elapse, before any considerable reputation or emolument can be obtained in London; and placing also in the balance the many highly valued friendships which he had formed at Norwich, the probability of more speedy advancement into practice in that smaller circle, and the more substantial happiness of domestic society, and of that intimate intercourse with a smaller number of real friends, which a provincial residence affords, he decided upon settling at Norwich. Accordingly, in the autumn of this year, 1806, he went to reside in that city. There was another circumstance, indeed, from which also he promised himself more essential happiness than from the splendour of metropolitan reputation or wealth, namely, the completion of an early engagement with a young lady, every way worthy of his attachment, and, in fact, remarkably resembling himself, in the possession of abilities and of solid attainments above the usual acquirements of her sex, as well as in the unaffected cheerfulness, candour, and benevolence of her disposition. This prospect was fully realized, and he ever rejoiced in the determination which fixed him at Norwich. He was married to Miss Taylor in 1807.

Although the medical practice at Norwich was greatly pre-occupied, especially by Dr. Lubbock, and by two or three distinguished surgeons, yet the value of Dr. Reeve was speedily recognized by the public, and he was almost immediately appointed physician to the Public Dispensary, on the resignation of Dr. Lubbock; and, on the occasion of the death of that much respected friend, in the year 1808, he was appointed his successor in the offices of physician to the Norfolk and Norwich hospital, and to the Bethel.

In the year 1809, Dr. Reeve committed to the press his only literary work, (his thesis, and the various papers mentioned in this memoir excepted) which was entitled, "An Essay on the Torpidity of Animals." He had pledged himself, at the conclusion of his inaugural thesis, in 1803, to prosecute the subject farther; and this essay comprises a considerable addition of information, both original and collected, to that which the thesis

contained. The third and fourth sections especially, which treat of "the variety of temperature in different classes of animals," with "general remarks on torpidity, on sleep, and on the application of cold in diseases," are replete with curious and interesting observations. It is clearly established, that cold, and want of food, are the principal remote causes of torpidity; but the principal question, by what means certain animals, with a double heart and circulation, are capable of existing, without any respiration, for a considerable period, and yet are recoverable, remains to be determined. The sources of animal temperature are not yet satisfactorily developed. Dr. Reeve has reasoned upon the subject acutely; but the subject itself is imperfectly understood, because we are not yet in possession of a sufficient collection of facts from which to deduce any ultimate inference. In October of the same year, on the return of the sick troops from Walcheren, Dr. Reeve was appointed temporary physician to the military hospital at Norwich. He was diligent in the investigation of the diseases which came under his care, and kept an accurate register of their appearances, and of the treatment which he pursued.

Not content with the bare performance of the duties required by his official situations, he kindly undertook to promote the progress of some young students connected with the hospital, by communicating to them, at stated periods, at his own house, his opinions on the subject of physiology; and subsequently, in the year 1811, he delivered a course of public lectures on the same subject. This course extended to twenty-five lectures, three of which were given weekly, according to the following plan:—Commencing with a sketch of the natural history of man, the lecturer proceeded to describe the characteristics of animal life, the nature of the muscular fibre, and the phenomena of muscular irritability, and pointed out the analogies and differences between the vegetable and animal world, and between man and the other animals. He then treated of the structure and functions of the brain, and of the distribution and influence of the nervous system; of the faculties and instincts of man and brutes; of the varieties of the organs of sense and motion; and of the senses of sight, hearing, touch, taste and smell, respectively; with incidental observations on ocular spectra, on the deaf and dumb, on the sympathies of

different parts, &c. Then followed disquisitions on the vital functions, circulation and respiration, and on digestion, secretion, absorption, and excretion; on animal temperature, and the influence of heat and cold; on the hybernation of animals, and on sleep: and the course was concluded with a view of the growth and gradual decay of the animal body, and of the means of restoration and reproduction; with remarks on population and longevity, on the means of preserving health and prolonging life, and on drunkenness, the temperaments, passions, and antipathies. These lectures were illustrated by various drawings and preparations, which contributed, with the simplicity and perspicuity of the language in which they were delivered, to interest the attention of his audience and to render a technical subject intelligible and agreeable.

The zeal and activity of Dr. Reeve were not, however, limited to professional pursuits. The same spirit of diligence and alertness manifested itself in all the concerns of life. Whenever any measure of public or private utility was proposed, his ardent mind entered quickly and steadily into the project, and his time and means were devoted to its accomplishment; particularly when the amelioration of the condition of the poor and ignorant was the leading object. While resident in London, his attention had been excited by the establishment of the system of general education, proposed by Lancaster; and in the course of his travels in Switzerland, he was delighted to meet with a similar institution at Iverdun, (so admirably described by Mad. de Stael,) and to have the opportunity of becoming acquainted with its benevolent and enlightened founder, with whom he entered into a minute examination of its plan. Being thus strongly impressed with the practicability of the design, and confident of the extensive benefits likely to result from enlightening the minds of the lower orders of mankind, Dr. Reeve was among the first to promote the establishment of a school at Norwich, upon the liberal plan of inviting the children of the poor, of all denominations of religion, to partake of the blessing of knowledge; maintaining, that it would be equally unjustifiable to refuse the benefit of education to the members of any sect, or to the advocates of any peculiar catechism, as it would be in him to limit his professional assistance to persons who held a particular

creed. His activity and personal exertion contributed materially to the establishment and success of this school; for at his house the preparatory meetings of the committee, which organized the institution, were held; and he voluntarily undertook a *census* of the infantine poor in his own district.

The same indefatigable zeal was greatly instrumental in promoting the formation and prosperity of a philosophical society at Norwich. If he did not actually found that establishment, he chiefly contributed to clear away the obstacles which opposed its foundation, and to harmonize and bring together the various combination of age, rank, talent, and taste, in the common cause of philosophical inquiry; and the little code of laws, by which its proceedings were regulated, was principally his work. His regular attendance at its meetings, the alacrity with which he entered into the discussions, the fluent simplicity of his elocution, and the various information which he brought forth, on the different subjects introduced to the society, contributed to the utility and success of the institution.

Thus constantly engaged in the active promotion of every useful and benevolent, object Dr. Reeve was at the same time rising steadily in professional reputation; and he had the satisfaction of finding not only that his practice and its emoluments were increasing, but that his skill, assiduity, and kind attention, were highly valued by those who received his aid. In the midst, however, of these gratifying prospects, secure of the ultimate rewards of his talents and acquirements, assured of the permanent confidence and attachment of his fellow-citizens, and happy, as one unusually capable of happiness, in the little domestic circle rising around him, as well as in the intercourse of a few intelligent and esteemed friends, he found his activity and his enjoyments gradually threatened by the symptoms of a slow disease. This insidious indisposition commenced about the end of the year 1811 or the beginning of 1812, and was observed with some alarm by his friends: but he still continued his usual pursuits; and it was not till the month of May, 1813, that he first mentioned the disease, in the course of a regular correspondence with the writer of this memoir. He then described it as a bad state of habit, or one of those conditions of the constitution treated by Mr. Abernethy among the "disorders of health." It was characterized by indigestion, weakness,

and local pains, which appeared to be sometimes muscular, and sometimes, he thought, in the nerves and bones; by swellings in the lymphatic glands, and an enlargement of the bone of the right arm. At this time he trusted that exercise on horse-back, country air, the shower-bath, and a nutritious diet, with an occasional alterative or laxative, (though the bowels had never been out of order,) would restore him in a little time to health. And during the summer of 1813 a considerable amendment was in fact produced; but he still suffered from a succession of tumours, which were tedious in suppuration, and slow in healing; and in the course of the winter the malady seemed to be again aggravated. In the following spring, the left knee was seized with pain and swelling, which occasioned so much lameness, as to render walking almost impracticable, and to prevent any communication with his patients except in a carriage; and even that was accomplished with pain and difficulty. In this state of lameness, with two puffy tumours on the scalp, and with a considerable loss of flesh and strength, he determined to quit Norwich and his profession for a time, in search of health; and, having first consulted several of his brethren in London, he resorted to the coast of Sussex, in the beginning of June 1814. In addition to the lameness of the knee, and to the glandular swellings and tumours of the scalp, which were multiplying and increasing, he had for two or three weeks felt some difficulty of respiration, with a sense of obstruction and huskiness in the larynx, as if from catarrhal inflammation, which also affected the voice. He found his general health improve, and his pains diminish, during his stay at Worthing, by the use of the warm sea-bath, and by the application of a blister and some other local expedients to the knee: but the wheezing increased, and the voice was nearly lost, especially in the mornings. About the 20th of July, indeed, this affection of the trachea became considerably aggravated; the difficulty of breathing increased, and a violent cough now ensued, with a discharge of mucus, sometimes tinged with blood. Hence he was induced to quit the sea-side, and proceed to Bath. On his arrival at Bath, on the 1st of August, he found the complaint in the wind-pipe less troublesome; but the swelling of the knee was not diminished; it was painful and hot, with an apparent increase of fluid in the cavity of the joint, while the leg was

cold and œdematous. Under the direction of Dr. Parry, who paid him the most friendly attention, eight leeches were applied to the knee, and afterwards some refrigerant lotions; and he took saline effervescing draughts with squills, and adopted an antiphlogistic regimen. The affection of the trachea somewhat abated, and the voice improved. One of the tumours of the scalp was opened by the knife, and discharged an albuminous fluid, with a good deal of blood, from a wounded twig of the temporal artery; the discharge continued free, and several ounces of blood were lost by a second hemorrhage. Diarrhœa now came on, and an erythematous inflammation attacked the left ear; and both these symptoms continued several days. The muscular pains were relieved; but the tongue became white, and the appetite failed. The knee becoming hot and painful, was again bled with twelve leeches; but these symptoms were not relieved, though the swelling and tension were somewhat diminished: and more decided fever ensued. Leeches were also applied to the vicinity of the trachea; and opium and James's powder were taken with a view to the relief of the dyspnœa and wheezing, which assumed somewhat more severity in the morning paroxysms, putting on occasionally the appearance of spasmodic asthma. The febrile symptoms were somewhat abated, when, on the 2d of September, Dr. Reeve set off on an easy journey to his father's house at Hadleigh, and passed a few days at Mr. Martineau's house, near Islington, for the purpose of rest, and of seeing some of his medical friends in London. He arrived at Hadleigh on the 16th of September. The inflammation of the wind-pipe was now obviously increased, producing much irritation and cough, augmenting the difficulty of breathing, and occasioning a sensation of choking in attempting to swallow. These symptoms were not relieved by blood-letting, the application of leeches, and free doses of hyoscyamus and opium. Restlessness, and agitating dreams ensued; and the respiration being more and more impeded, by the increasing disease in the respiratory tube, he sunk calmly, in the full possession of his faculties, and in his accustomed serenity of mind, under the roof of his father, and in the presence of his afflicted wife and mother, on the 27th of September 1814, in the thirty-fourth year of his age.

The regret which followed this event at Norwich was great

and universal. Expressions of sorrow and esteem occupied the columns of the public journals; the Philosophical Society adjourned its subsequent meeting, on the motion of the president, after a warm eulogium had been pronounced on his character by the gentleman who seconded the motion; and his loss was widely lamented in private by those who knew his worth, and both by the rich and the poor who had experienced his kindness and sympathy in the hour of sickness. Indeed, in whatever view his character is contemplated, it was calculated to call forth these testimonials of attachment, and to live in the recollection of all who knew him.

Possessed of a vigorous understanding and great acuteness, he had stored his mind with the riches of literature and science, and had highly cultivated his taste. He quickly appropriated the information which reading, observation, or the most casual conversation threw in his way, and as readily brought it into use when occasion required it. Hence his conversation was various and intelligent, tempered by a mildness of voice and manner, indicative of gentleness of disposition, yet invariably terse and animated, with a considerable propensity to humour, where the subject admitted of it. His unvarying cheerfulness and benevolence of temper, indeed, gave a charm to every action of his life; it extorted the attachment of strangers, and riveted the love of his friends; for it was uniform and unchanged under all circumstances; in the privacy of the domestic circle, in the more general company of friends, in public meetings, and in the midst of his professional labours and fatigues; and it continued, to a degree truly remarkable, through the whole course of his lingering and painful illness, to the very period of its termination. His unaffected benevolence and neverfailing zeal, led him, as we have seen, to incessant exertions in the cause of humanity, even while his own health and comfort were impaired; and it was remarked, that he uniformly appeared to be the least oppressed by his own malady, when he was called upon to administer to the relief of others.

The opinions of the generality of men, respecting the great questions of politics and religion, are modelled by those of the circle in which they happen to move; but those of Dr. Reeve were not adopted without much reflection, aided by a sound

judgment, and a considerable knowledge of mankind, and were of a highly liberal character. Being always the zealous friend of truth and justice, his wishes were ever on the side of liberty, both civil and religious; he held in abhorrence all systems of fraud and oppression, and detested the attempts of bigotry and superstition, to throw shackles over the human mind. Nevertheless, he held these opinions in the spirit of benevolence, and adhered to no party; being willing to hope, that those who differed from him were actuated by similar motives, and in pursuit of the same objects with himself, however mistaken in the rites which they practised. With such views and dispositions, his duties in private were necessarily performed with the same correctness and zeal, as those of his public and professional life. By the judicious estimate of the true value of domestic happiness, indeed, he had early sacrificed the more captivating allurements of ambition and fame in the metropolis; and in the enjoyment of this choice, he evinced, in the character of husband, father, and friend, how much he was destined to promote the felicity of those around him. In short, to borrow the words of a public memorial of him, "his duties in private life were no less happily discharged than those of his profession; his mind was open, generous, lively, simple, and affectionate; and those to whom he was united, as a relative, or a friend, will ever turn with melancholy complacency to the remembrance of his faithful and active attachment, of his cheering conversation, and of his pleasing and valuable accomplishments."

In order to avoid any interruption in the narrative of his indisposition, we omitted to state, that, upon the completion of a large building, intended as a lunatic asylum for the county of Norfolk, in the spring of 1814, Dr. Reeve was appointed physician to it, in conjunction with Dr. Wright,—a measure which was proposed by themselves, with the view of avoiding the pain of a contest, where their claims appeared to be nearly equal. We should also add, that he was elected a Fellow of the Linnean Society, probably about the year 1806, and on settling at Norwich, he became an extra-licentiate of the College of Physicians in London.

In addition to the literary productions already mentioned, several papers were furnished by Dr. Reeve to this Journal.

namely, an Account of some Cases of Tumour in the breast, Vol. I. p. 159: six of the anonymous papers entitled "the Inquirer," besides the one already noticed, numbered 14, 17, 18, 20, 21, and 22, and including disquisitions relative to the "conversion of diseases," pointed out by Dr. Ferriar; the causes of stone and gravel, the deaf and dumb, diabetes, and some miscellaneous subjects, under the title of "Medical Gleanings." The eighth volume of the Journal also contains an essay from him on the treatment of chorea, and a brief account of the German Universities. We may also state, that in the second volume of the late Dr. Currie's "Reports on the effects of water, cold and warm," &c. a communication was published from Dr. Reeve, containing an account of the effects of cold affusion, which was used for the first time at Edinburgh, by Dr. James Home, in the clinical wards of the Infirmary, while he was a student there.

B.

ORIGINAL PAPER.

TO THE EDITORS OF THE ECLECTIC REPERTORY.

Description of a New Self-Registering Thermometer.

Contrived by EDWARD CLARK, of Philadelphia. March, 1816.

THERE are few subjects, perhaps none, in which we feel ourselves more deeply interested than in meteorology; since, on the modifications and changes, that are constantly taking place in the heterogeneous fluids which compose our atmosphere, not only the health and life of man, but the very circumstance of all organized beings depend. Hence a knowledge of it is desirable, and its study exceedingly interesting; particularly, as by keeping circumstantial records of the changes that recently and remotely occur, and comparing them, we are enabled to ascertain the revolutions in climate that happen in similar latitudes or in the same place, as also what precise climate is best adapted for any particularly depending effect; and when they influence our health and consequently our happiness, to detect and often remove the causes.

To render the pursuit of some of the branches of this science easy and intelligible, it became necessary to establish points, from which comparative deductions were to be drawn. With this view various instruments or guages have been made; of which the small mercurial thermometer for the measurement of disengaged or free caloric is perhaps the most perfect; but even with this, the extremes of *heat and cold* could not be known without constant observation. To obviate a task so irksome, and at the same time to ascertain the maximum and minimum of temperature with precision, thermometers, calculated to register the extremes, were constructed; but which, from their liability to errors, did not answer the designed purpose. Nevertheless, the object appearing attainable, I lent it some attention, and the result, as far as I have tried, exceeds my expectations; but the most experienced and careful are sometimes deceived and commit errors; and as my claim to those qualities is very limited, I shall decline attaching any importance to the discovery, at least till time and further ex-

periment has more fully tested it. The promotion of this object is the reason, and I hope will be a sufficient apology for requesting you to publish my plan. Others who have more leisure than myself, and who are better qualified to judge of its utility, may perhaps construct one and give it a full trial. Hoping, that such may be the case, I send you a rough sketch, accompanied with explanations and remarks, which I believe are sufficiently clear to enable almost any person to construct, or direct the construction of one.

The entire drawing represents a verticle-sectional, and skeleton view of the Thermometer.

A.—Represents the superior part of the bulb of the thermometer filled with alcohol, atmospheric air, or some other greatly expanding fluid, which being compressed by balances the mercury *C. C.* contained in the tube *B.* and in the lower part of the bulb; it is also designed for the expanding medium.

B.—A glass tube curved in the upper part to a semicircle. The lower part is closely cemented in the mouth of the bulb, and passes very near its bottom.

C. C.—Mercury in the bulb and tube, which serves as a vehicle to sustain *D.*

D.—An iron ball, floating on the surface of the mercury in *B.*

E.—A magnetic needle playing on the pivot *I.*

F.—The main hand connected to the needle at the pivot *I.*, and pointing across the ball *D.*, to the index *K.*

G. G.—Two very delicate hands moving on the pivot *I.* and unconnected with any other part of the thermometer.

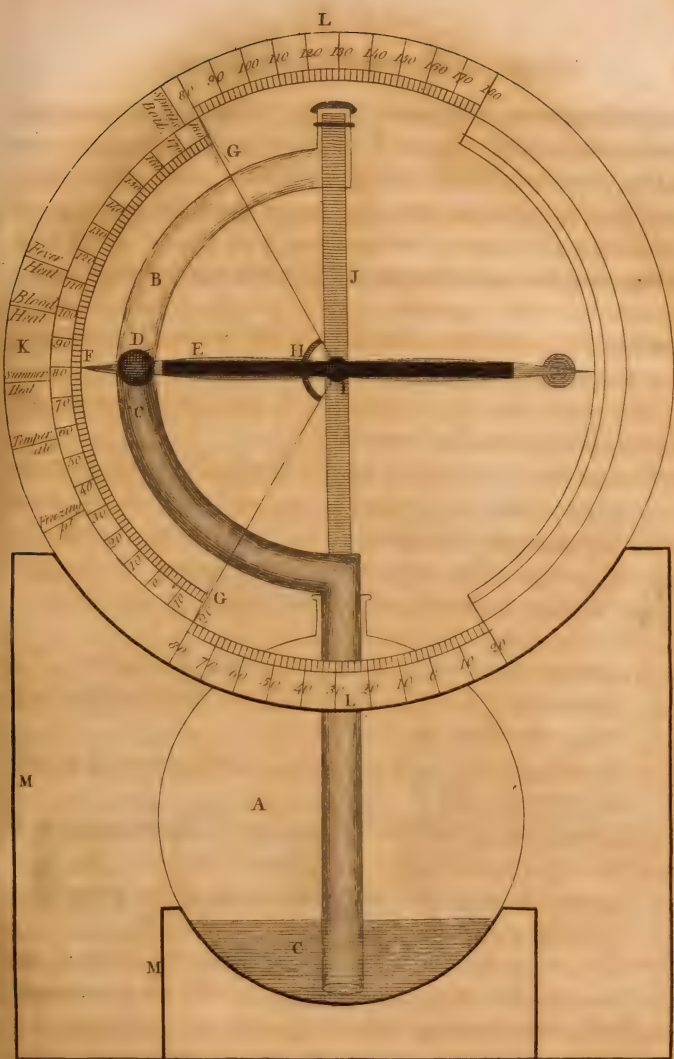
(*Note.*)—In constructing a thermometer of this kind, it is hardly necessary to remark, that all the parts, except the hands and the circular rod *H.*, should be placed at the back of the face containing the index.

H.—A small circular rod connected to the main hand, and as that moves up or down, intended to move the small hands along with it.

I.—A pivot placed into the centre of the circle, of which the curved end of the tube forms a part.

J.—A support, fastened to the tube or neck of the bulb, in which the pivot *I.*, is secured.

K.—An index, adjusted to Fahrenheit's thermometer.



L. L.—An index divided, but corresponding with *K.* to which the small hands point. This index, as will be seen by the sketch *N.*, is not essential.

M. M.—The case which covers and supports the thermometer.

N.—A different arrangement of the hands, by which one index is sufficient. For a description of which, refer to *B.*, *C. C.*, *D.*, *E.*, *F.*, and *G. G.*, as before represented.

The *modus operandi* is so simple as hardly to require a description; for if by the increase or diminution of temperature the mercury in the tube rises and falls, it is evident that the needle will always (from the influence of the magnetic fluid or principle,) point to the centre of attraction within the iron ball floating on its surface; and as the main hand is attached to the needle, it will indicate such changes at the index. The two small hands being brought in contact with the circular rod connected to the main hand, will always be farther separated from each other, as that may rise or fall, and allowance being made for the resistance, show the extremes of those changes. The index should correspond with the movements of the needle and main hand by themselves; then the resistance of the small hands may be readily calculated by any other thermometer with a similar index. As the small hands do not recede, they must, to give a diary of the changes, be daily adjusted.

For the small hands, rings or springs constructed to slide on a wire, &c. may be substituted for registers, but that which moves with the least resistance, should be preferred. If a common sized Florence flask be used for a bulb, and alcohol for the expanding medium, the caliber of the tube should be about four and a half or five lines in diameter, varying according to the size of the flask; when a fluid more expansible than alcohol is used, the diameter should be increased; the most expansible is preferable, as it enables the use of a greater attracting power. This kind of thermometer is not very sensible, but is much more so, than at first would be supposed.

When atmospheric air, or any other compressible fluid, is used for the expanding medium, the tube should be hermetically sealed; under other circumstances, a cork will be found sufficient to protect the mercury from dust and the action of oxygen.

Care must be taken that it always be kept in a perpendicular direction; for if any portion of the expanding fluid be suffered to escape, it will be necessary to add more mercury, or re-adjust the index. It may be plainly or ornamentally cased; and will, I have no doubt, if care be taken in the construction, answer the designed purpose.

We are indebted to a respectable philosophical friend for the following remarks.

Mr. Clark's thermometer for registering the two extremes of temperature within any given period, may serve very well as another variety in addition to those already made for the same purpose. It may, however, be remarked:

1. The magnetic needle, which is used as an index, will be, in some measure, affected by the general attraction of magnetism, as well as by that of the iron ball, which will affect its accuracy.
2. Unless the iron ball be of considerable magnitude, its action on the index will be very feeble, provided this be not very light, in which case its mechanical action on the moveable hands G. G. will be scarcely sensible.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Small-Pox and Vaccination.

THE small pox re-appeared in this city about the beginning of December last, after an absence of several years. About 30 persons have died of this loathsome disease.—Much public interest has been excited in order to put a stop to its ravages, by endeavouring to promote a general vaccination. For this purpose Ward meetings have been held throughout the city. Meetings of the inhabitants of the district of Southwark, and of the Northern Liberties, have also been called for the same valuable purpose.

The exertions of the Vaccine Society for vaccinating the poor at their own habitations, have been laudably increased; so that we may reasonably hope that an effectual stop will be put to this terrible disease, and that the present warning will serve to excite our fellow citizens in future, to a constant attention to the necessity of having their children vaccinated at an early age.

Native Epsom Salt.

Louisville, (Kentucky,) Feb. 12, 1816.

It gives us much pleasure to inform our readers of the discovery of an extensive cave of native Epsom salt, or sulphate of magnesia, about thirty-six miles from this place, near the town of Corrydon, (Indiana Territory.) The cave is apparently inexhaustible; salt, of every variety of crystal, is arranged in all that fanciful splendor which decorates the grotto of Antiparos. This cave is the only specimen known of the pure salt in a solid form, except in Monroe county, (Virginia) where it is found under the surface of the earth. In Europe, and particularly in England, at the Epsom springs, which give name to the salt, it is obtained from water impregnated with it. We cordially hope that this native treasure will richly reward the chemical knowledge and enterprize of Doctors Burrel and Adams, of this town; who have the merit of analyzing and ascertaining this gentle and delightful cathartic. We have been promised some further particulars of the situation, dimensions, &c. of the cave, which will shortly be presented to the public.

Earthquakes.

Two smart shocks of an earthquake were felt in Weston, Massachusetts, between the hours of two and five o'clock, in the morning of the 15th Feb. 1816, supposed to be much more violent and of longer duration, than that of last winter. They were accompanied by the same undulatory motion and noise, which characterize the earthquakes of this part of the world. We have anxiously sought in some of the papers for some accounts of these phenomena, expecting to ascertain their extent and comparative violence in other parts. As no notice appears to have been taken of them in the public papers, it is presumed they were confined to this vicinity. At the time of the earthquakes, the air was calm and intensely cold. Many were awakened from sleep by the motion of their houses, or by the peculiar noise attending it. On the day following, fissures or cracks were discovered in the earth, extending to a great distance, and branching in various directions. Some of these cracks were ascertained to be several feet deep, and were it not for the extreme hardness of the earth, their depth might have been more accurately ascertained.

The writer has not been able to learn if such appearances are ever produced by extreme cold, and is therefore at a loss to determine, whether these extensive cracks are the *causes* or the *consequences* of the earthquakes. It is hoped that some person, more experienced in such phenomena, will communicate his observations to the public. If they answer no other important purpose, they may serve to amuse the curious in geology.—*Weston, Feb. 19.*

[The above Earthquakes were noticed at Sudbury and Framingham. At the former place the ground opened as at Weston. An earthquake was felt at Framingham and Sudbury about four months since, at ten o'clock in the morning.]

Retreat for the Insane.

At the present time, when a considerable degree of interest is excited respecting the treatment of insane persons, and when the government of our country has made it a subject of legislation, it is presumed that any account of existing institutions,

which may throw light on the method of treating this deplorable class of our fellow-creatures, may be desirable.

The 19th report of the institution established at York in the year, 1796, for the reception of Insane Persons of the Society of Friends, and which is under their control, will, we doubt not, be acceptable to our readers.

“ In concluding the 19th report of the state of the Retreat, the directors can hardly refrain from expressing the feelings of gratitude and satisfaction, with which they contemplate the prosperous state of this institution; the benefits which have resulted from it, to the immediate objects of its care, and the stimulus which its example has given to the improvement of establishments for similar purposes.

“ Fourteen patients have been admitted since last year. In the same period, ten have been discharged, recovered, and three in an improved state. Two patients have died, one aged about 80, and the other 78 years.

“ There are now 63 patients under care, viz. 25 men and 38 women, of whom 4 men and 7 women are at the appendage.

“ From the opening of the Retreat to the end of the year 1814, 177 patients were admitted, of whom 100 had been disordered more than 12 months. Of these latter cases, which are generally denominated incurable, 26 have been happily restored to society; and of the 77 recent cases, 59 have been so restored.

“ It is also worthy of remark, as affording satisfactory evidence of the good management of the institution, and of the importance of early attention to cases of insanity, that of the 16 recent cases admitted in the last three years, 15 have already been discharged recovered.

“ The directors cannot but attribute, under the divine blessing, much of the prosperity and success of this institution to the openness with which its affairs have been conducted; the uniform interest for its welfare evinced by its patrons and managers; and, in an eminent degree, to the conscientious and judicious discharge of the arduous duties, by the persons who have, for so many years, had the immediate superintendence and management of the establishment.

“ A steady attention to these causes of success, they trust will long support the character and usefulness of the Retreat,

and insure a continuance of that liberality by which it has hitherto been supported.”

Many judicious remarks, as regards the peculiar mode of treatment, resorted to in the above institution, may be collected from a volume lately published by S. Tuke, entitled, “Description of the Retreat,” &c.—*London Times*, Aug. 1815.

Royal Society of London.

This society have just published the first part of its Transactions for 1815, and the following are its contents:—

Additional Observations on the optical Properties and Structure of heated Glass and unannealed Glass Drops; by Dr. Brewster.

Description of a new Instrument for performing mechanically the Involution and Evolution of Numbers; by Dr. Roget.

Experiments on the Depolarization of Light as exhibited by various Mineral, Animal, and Vegetable Bodies, with a Reference of the Phenomena to the general Principles of Polarization; by Dr. Brewster.

On an ebbing and flowing Stream discovered by boring in the Harbour of Bridlington; by Dr. Storer.

On the Effects of simple Pressure in producing that Species of Crystallization which forms two oppositely polarized Images, and exhibits the complementary Colours by polarized Light; by Dr. Brewster.

Experiments made with a View to ascertain the Principle on which the Action of the Heart depends, and the Relation which subsists between that Organ and the Nervous System; by Dr. Philip.

Experiments to ascertain the Influence of the Spinal Marrow on the Action of the Heart in Fishes; by Mr. William Clift.

Some Experiments and Observations on the Colours used in Painting by the Ancients; by Sir Humphrey Davy.

On the Laws which regulate the Polarization of Light by Reflection from transparent Bodies; by Dr. Brewster.

On the 25th of May, a paper by Dr. Parry was read to the Society, *on the Nature and Cause of the Pulse*. Dr. Parry took

a review of the different theories which have been proposed to account for the phenomenon of pulsation, observing that the greater part of physiologists had contented themselves with the opinion of Haller, that pulsation was occasioned by the diastole and systole of the heart. His view, however, of the question, is much simpler; on examining different arteries where they were exposed to no obstruction or pressure, he found that they had no pulse: by pressing the finger on an artery over a soft part of the body, which yielded sufficiently to the pressure, no pulse was manifested; but, whenever an artery was pressed over a solid part, then a pulse was immediately found. He repeated these operations several times, and uniformly found the same effects. Hence he concludes, that the pulse is nothing more than the re-action or impetus of the blood to maintain its regular motion. The arteries appear only as canals through which the blood flows in an uniform and continuous current; diminish the diameter of the canals, and a pulse is immediately perceived. At every junction of a vein with an artery, the internal diameter of the latter is diminished, and hence a pulse always appears. This Dr. Parry thinks fully adequate to account for all the modifications of the pulse.

J. G. Children, Esq. submitted to the Society, a description of his very large galvanic battery, each plate of which consisted of thirty-two square feet, and related the effects of a great number of experiments made with it in producing intense heat, in melting metals, &c. One experiment was on iron. He and Mr. Pepys took a piece of soft iron, made a cavity in it to hold some diamond powder, and then submitted it to the action of the galvanic battery; when the iron was instantly converted into blister steel, and the diamond entirely disappeared. This experiment, the author concluded, was quite satisfactory to prove that the diamond contains nothing but pure carbon.

London Monthly Magazine, Aug. 1815.

ROYAL SOCIETY.

The Philosophical Transactions for 1815, Part II. have appeared, and contain the following papers.

On some Phenomena of Colours, exhibited by thin plates; by John Knox, Esq.

Some further Observations on the Current that often prevails to the westward of the Scilly Islands; by James Rennell, Esq. F. R. S.

Some Experiments on a solid Compound of Iodine and Oxygen, and on its Chemical Agencies; by Sir H. Davy, L. L. D. F. R. S.

On the Actions of the Acids on Salts, usually called Hyperoxymuriates, and on the Gases produced from them; by Sir Humphrey Davy.

Further Analytical Experiments relative to the constitution of the prussic, of the ferruretted chyazic, and of the sulphuretted chyazic acids: and to that of their salts; together with the application of the atomic theory to the analyses of these bodies; by Robert Porrett, Jun. Esq.

On the Nature and Combinations of a newly discovered Vegetable Acid: with observations on the malic acid, and suggestions on the state in which acids may have previously existed in vegetables; by M. Donovan, Esq.

On the structure of the Organs of Respiration in Animals, which appear to hold an intermediate place between those of the Class Pisces and the Class Vermes, and in two genera of the last mentioned class; by Sir Everard Home, Bart. V. P. R. S.

On the mode of generation of the Lamprey and Myxine; by Sir Everard Home, Bart. V. P. R. S.

On the multiplication of Images, and the Colours which accompany them in some specimens of calcareous spar; by David Brewster, L. L. D. F. R. S. Lond. and Edin.

A series of Observations of the Satellites of the Georgian Planet, including a passage through the node of their orbits; with an introductory account of the telescopic apparatus that has been used on this occasion: and a final exposition of some calculated particulars deduced from the observations; by William Herschel, L. L. D. F. R. S.

An account of some experiments with a large Voltaic Battery; by J. G. Children, Esq. F. R. S.

On the dispersive power of the atmosphere, and its effect on astronomical observations; by Stephen Lee.

Determination of the North Polar distances and proper motion of thirty fixed stars; by John Pond, Esq. Astronomer Royal, F. R. S.

An essay towards the Calculus of Functions; by C. Babbage, Esq.

Some additional Experiments and Observations on the relation which subsists between the nervous and sanguiferous systems; by A. P. Wilson Philip, Physician in Worcester.

London Monthly Magazine, for January, 1816.

A few months since we noticed Mr. Carpue's successful restoration of the nose of Capt. Williamson, and we have now the pleasure to state, that he has since succeeded in performing a similar operation on Capt. Latham. The same eminent surgeon has recently extended the principle, and has restored an entire lower jaw to an officer who had lost it in battle, by uniting the integuments of the neck with those of the under part of the face. *Id.*

Sir Everard Home has published some interesting observations on the influence of the nerves upon the action of the arteries. That the pulsations of the arteries correspond in their frequency with the contractions of the left ventricle of the heart, is, says he, universally admitted; and those pulsations continuing in the arteries after the limb to which they belong is rendered paralytic, has led to the belief, that all arterial action is independent of nervous influence; but he proves, that the nerves which accompany the arteries regulate their actions, and it is through their agency that the blood is distributed in different proportions to the different parts of the body. He ascertained by experiment, that the increase and the diminution of the action of an artery does not depend upon irritability, but nervous influence; and this influence of the nerves upon the arteries throws, he says, considerable light upon some of the most important actions in the animal economy.

By its means, the same arteries, at different times, allow very different proportions of blood to pass through them, and those employed in furnishing blood for the secretions have the supplies regulated; which explains the use of the system of nerves with which the blood-vessels of the viscera are so abundantly furnished. On this dominion of the nerves over the actions of arteries depends the growth of the body, the regeneration of parts in those animals, in which it occurs, as lizards and others, and the formation of tumours of all the different kinds. The circulation of the blood is therefore no longer to be considered as wholly dependent upon the heart and the elasticity of the arteries; for, although by these alone it can be kept up, the action of the nerves is necessary to regulate the distribution of the blood to the different parts of the body, according as supplies are wanted to carry on the necessary operations of the animal economy.

Abstract of the Bill of Mortality, for the city and precincts of Baltimore, from the first of January, 1815, to the first of January, 1816.—Agreeably to the Record kept in the Office of the Commissioners of Health.

	Males.	Females.	Total.	Ages.				
				Under	1 year	-		448
				From	1 to	2	-	73
January,	69	52	121		2 to	3	-	35
February,	53	48	101		3 to	5	-	57
March,	58	41	99		5 to	10	-	70
April,	73	66	139		10 to	20	-	192
May,	39	47	86		20 to	30	-	174
June,	48	36	84		30 to	40	-	107
July,	66	55	121		40 to	50	-	58
August,	75	68	143		50 to	60	-	47
September,	70	59	129		60 to	70	-	37
October,	46	48	94		70 to	80	-	37
November,	68	47	115		80 to	90	-	8
December,	77	40	117		90 to	100	-	5
	742	607	1349		100 to	110	-	1
				Total, 1349				

*The Deaths above were caused by Diseases and Casualties
as follow:*

Apoplexy, - - - 5	Jaundice, - - - 3
Asthma, - - - 2	Liver Inflammation, - 9
Bleeding, - - - 1	Lock Jaw, - - - 3
Cancer, - - - 3	Mortification, - - - 5
Casualties, - - - 21	Meazles, - - - 8
Consumptions, - - 218	Murder, - - - 2
Croup, - - - 47	Old Age, - - - 83
Cholic, - - - 8	Palsy, - - - 5
Child-birth, - - - 22	Pleurisy, - - - 108
Cholera Morbus, - 167	Poison, - - - 1
Drowned, - - - 23	Putrid Sore Throat, - 2
Dropsy, - - - 34	Quinsy, - - - 5
Dysentery, - - - 7	Rheumatism, - - - 2
Fever, Bilious, - - 67	St. Anthony's Fire, - 3
Typhus, - - - 85	Suicide, - - - 4
Intermitting, - 5	Still born, - - - 96
Nervous, - - - 1	Sudden, - - - 9
Fits, - - - 98	Teething, - - - 9
Flux, - - - 6	Thrush, - - - 2
Hooping Cough, - - 9	Unknown, - - - 60
Hives, - - - 1	Worms, - - - 75
Insanity, - - - 3	
Influenza, - - - 25	
	Total, 1349

By order of the Board of Health,

P. G. HANDS, Secretary.

*Bill of Mortality, in New Haven, Connecticut, from January 1,
1815, to January 1, 1816.*

<i>Deaths in each Month.</i>		<i>Ages.</i>	
January, - - - 6	Under 5 years, -	121	
February, - - - 6	From 5 to 10 -	18	
March, - - - 7	10 to 20 -	15	
April, - - - 8	20 to 30 -	7	
May, - - - 7	30 to 40 -	15	
June, - - - 5	40 to 50 -	7	
July, - - - 13	50 to 60 -	9	
August, - - - 38	60 to 70 -	9	
September, - - 73	70 to 80 -	11	
October, - - - 21	80 to 90 -	0	
November, - - 20	90 to 100 -	1	
December, - - 9			
			Total, 213

The number of Deaths in 1814, 100; in 1813, 228.

FOR THE ECLECTIC REPERTORY.

Statement of Deaths, with the diseases and ages, in the City and Liberties of Philadelphia, from the 1st of January 1815, to the 1st of January 1816.

DISEASES.	Under 1 year	From 1 to 2	From 2 to 5	From 5 to 10	From 10 to 20	From 20 to 30	From 30 to 40	From 40 to 50	From 50 to 60	From 60 to 70	From 70 to 80	From 80 to 90	From 90 to 100	From 100 to 110	Total
Aphtha - - - -	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Asthma - - - -	0	0	0	0	0	0	1	1	0	3	0	2	0	0	7
Abscess - - - -	2	0	0	1	0	0	1	0	0	0	0	0	0	0	4
Aneurism - - - -	0	0	0	0	0	1	0	0	2	0	0	0	0	0	3
Apoplexy - - - -	0	0	0	0	0	2	6	6	20	6	3	6	1	0	50
Atrophy - - - -	4	1	2	0	2	2	5	0	7	2	1	1	1	0	29
Angina Pectoris -	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Burns - - - -	3	3	4	3	0	0	0	0	1	0	0	0	0	0	14
Cancer - - - -	0	0	0	0	0	0	1	2	3	1	1	1	0	0	9
Casualties - - - -	2	0	0	1	3	3	3	3	0	1	0	0	0	0	16
Catarrh - - - -	4	4	3	0	0	1	3	1	2	3	0	0	0	0	21
Child Bed - - - -	0	0	0	0	0	3	2	2	0	0	0	0	0	0	7
Cholera Morbus -	57	26	6	3	0	1	0	1	0	0	0	0	0	0	94
Colic - - - -	1	2	0	0	1	5	4	2	3	0	0	0	0	0	18
Consumption of the Lungs }	0	4	7	16	80	103	54	47	25	8	3	0	0	0	347
Convulsions - - -	144	13	4	6	0	1	8	3	1	0	0	0	0	0	180
Caries - - - -	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3
Cachexy - - - -	0	0	0	0	0	1	1	1	0	0	0	1	0	0	4
Contusion - - - -	1	0	1	0	0	0	4	0	0	0	0	0	0	0	6
Decay - - - -	7	4	5	6	3	7	4	3	13	3	7	1	0	0	63
Diarrhœa - - - -	8	2	2	0	6	3	1	2	7	1	1	0	0	0	33
Dropsy - - - -	1	1	5	0	2	6	11	9	8	7	3	0	0	0	53
of the Breast - -	2	1	1	4	1	5	3	0	2	0	0	0	0	0	19
in the Brain - -	31	11	7	10	1	3	0	1	0	1	0	0	0	0	65
Drowned - - - -	0	1	2	3	2	3	10	9	2	2	0	0	0	0	34
Dysentery - - - -	6	6	7	4	2	4	2	5	2	6	0	0	0	0	44
Drunkenness - - -	0	0	0	0	0	0	0	2	0	4	1	0	0	0	7
Disease in Hip Joint	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
Debility - - - -	15	2	1	1	0	2	7	8	1	5	8	2	0	0	52
Epilepsy - - - -	0	1	0	1	1	0	1	1	0	0	0	0	0	0	5
Erysipelas - - -	0	1	0	0	0	2	1	3	0	0	0	0	0	0	7
Eruption - - - -	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Fracture - - - -	0	0	0	0	1	0	1	2	0	0	1	0	0	0	5
Fever - - - -	5	2	4	1	5	4	5	5	0	0	2	1	0	0	35
Intermittent - - -	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Remittent - - - -	0	0	4	1	2	3	2	3	0	3	1	1	0	0	20
Bilious - - - -	0	2	1	0	0	4	6	6	0	1	0	0	0	0	20
Nervous - - - -	0	0	0	1	1	2	2	2	0	0	0	0	0	0	8
Malignant - - - -	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
Typhus - - - -	3	0	2	0	7	22	21	14	10	5	0	0	0	0	84
Puerperal - - - -	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
Hectic - - - -	0	0	0	0	0	0	2	0	0	1	0	0	0	0	3
Inflammatory - -	0	0	0	0	0	0	4	1	0	0	0	0	0	0	5
Gangrene and Mortification }	2	0	1	0	1	0	2	3	1	2	0	0	0	0	12
Gout - - - -	0	0	0	0	0	0	0	1	2	1	0	0	0	0	3
Gravel - - - -	0	0	0	0	0	0	0	1	1	0	1	0	0	0	4
Hooping Cough - -	3	1	1	1	0	0	0	0	0	0	0	0	0	0	6
Hives - - - -	9	2	7	1	0	0	0	1	0	0	0	0	0	0	20
Carried over,	311	91	79	66	124	196	179	156	109	69	33	16	2	0	1431

	Total	From 100 to 110	From 90 to 100	From 80 to 90	From 70 to 80	From 60 to 70	From 50 to 60	From 40 to 50	From 30 to 40	From 20 to 30	From 10 to 20	From 5 to 10	From 2 to 5	From 1 to 2	Under 1 year
<i>Brought forward,</i>	311	91	79	66	124	196	179	156	109	69	33	16	2	0	1431
Hernia - - - -	0	0	0	0	1	1	0	1	1	2	0	0	0	0	6
Hæmorrhage - - -	0	1	0	0	1	1	3	1	1	0	0	0	0	0	8
Inflammation of the Brain }	3	2	2	3	9	0	2	0	0	0	0	0	0	0	21
of the Lungs - -	1	1	1	0	1	1	1	2	0	1	0	0	0	0	9
of the Stomach -	5	2	2	4	2	3	3	6	3	3	2	0	0	0	35
of the Bowels - -	2	2	0	0	0	1	1	4	3	1	0	1	0	0	15
of the Liver - -	0	6	0	0	1	3	3	3	3	1	0	1	0	0	21
Insanity - - - -	0	0	0	0	0	7	14	5	4	2	3	0	0	0	36
Jaundice - - - -	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
Locked Jaw - - -	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4
Measles - - - -	1	3	2	0	1	0	0	0	0	0	0	0	0	0	7
Murdered - - - -	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Old Age - - - -	0	0	0	0	0	0	0	0	1	1	19	25	13	1	60
Pleurisy - - - -	11	3	2	3	2	20	11	40	11	12	8	3	0	0	126
Palsy - - - -	0	0	0	0	0	3	3	3	2	5	4	1	0	0	21
Rheumatism - - -	0	0	0	0	0	2	3	3	2	1	0	1	0	0	12
Scrofula - - - -	2	2	6	1	0	4	3	0	1	0	0	0	0	0	19
Sore Throat - - -	4	0	0	4	3	0	1	1	1	0	0	0	0	0	14
Still Born - - -	97	0	0	0	0	0	0	0	0	0	0	0	0	0	97
Suicide - - - -	0	0	0	0	0	2	1	1	1	0	0	1	0	0	6
Sudden - - - -	5	0	0	0	0	6	8	8	6	3	0	0	0	0	36
Syphilis - - - -	1	0	0	0	0	1	3	2	0	0	0	0	0	0	7
Strangury - - -	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Teething - - - -	3	2	2	1	0	0	0	0	0	0	0	0	0	0	8
Typhoid - - - -	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Typhus - - - -	1	0	0	0	0	0	0	0	2	0	1	0	0	0	4
Vornis - - - -	3	1	0	5	1	0	0	1	0	0	0	0	0	0	11
Unknown - - - -	5	0	0	1	0	2	5	1	3	3	0	0	0	0	20
<i>Total,</i>	455	116	97	89	147	254	249	238	155	103	72	49	18	1	2040

NOTE. Of the above there were 763 males of twenty years and upwards, 371 under twenty years: of females, 490 of twenty years and upwards, 284 under twenty years, and 32 children, principally under one year, whose sex is unknown.

Deaths in each month of the above period.

	Adults.	Children.	Total.		Adults.	Children.	Total.
January - - -	88	43	131	October - - -	105	64	169
February - - -	70	52	122	November - - -	119	58	177
March - - -	116	66	182	December - - -	122	67	189
April - - -	113	49	162				
May - - -	99	58	157	<i>Total - - -</i>	<i>1250</i>	<i>790</i>	<i>2040</i>
June - - -	126	71	197				
July - - -	78	75	153	By order of the Board of Health,			
August - - -	124	102	226	JOHN ALLISON, Clerk.			
September - - -	90	85	175	Health Office, February 14th, 1816.			

Bill of Mortality, as observed and reported by Isaac Ball, M. D. Assistant in the Board of Health of New-York, commencing January 1st, and ending Dec. 31, 1815.

	Consumption.	Small-pox.	Various Diseases.	Total.
January,	43		105	148
February,	46		118	164
March,	49		118	167
April,	65		149	214
May,	66		161	227
June,	60		117	177
July,	29		132	161
August,	63	2	180	245
September,	46	3	183	232
October,	43	8	177	228
November,	54	18	105	177
December,	56	62	161	279
	<hr/> 620	<hr/> 93	<hr/> 1706	<hr/> 2419

Variola, (small-pox,) varicella, (chicken-pox, &c.) have prevailed in the city and suburbs of New-York. The first has been attended with great mortality, and by the number of its victims (about one hundred and ninety,) it has certainly proved that vaccination is either much neglected, or not universally resorted to for prevention. Not a single instance of failure, however, has been heard of, that has been attended with fatal small pox.

Of this loathsome disease Sydenham has witnessed the great influence or agency of the atmospheric constitution, to propagate and extend its ravages, at different periods of time, with aggravated symptoms, which seemed to constitute various sorts of small-pox. (Vide Syd. by Rush, sec. iii. c. 1.) Hence, besides its casual introduction from abroad, the keeping of variolous matter by physicians, or other persons, even for practical use or experiments, is much to be deprecated as an additional cause of danger. At this late period (January 30,) we cannot foretel, amidst so large a population, how and when it will be extirpated.—*New-York Med. Repository, Feb. 1816.*

FOR THE ECLECTIC REPERTORY.
UNIVERSITY OF PENNSYLVANIA.

APPOINTMENTS BY THE TRUSTEES.

NATHANIEL CHAPMAN, M. D. Professor of the Institutes and Practice of Physic, and of Clinical Medicine.

JOHN SYNG DORSEY, M. D. Professor of Materia Medica.

AT a public Commencement held at the University on the fifth day of April, 1816, the Degree of DOCTOR OF MEDICINE was conferred on the following gentlemen, who submitted the Theses subjoined to their respective names.

From New-York.

Harvey Klapp, On Cholera Infantum.

New Jersey.

John W. Jenks, On Typhus Fever.

Edward Q. Keasby, On Cataract.

Zaccur Prall, On Dysentery.

Samuel C. Hopkins, On Typhus Fever.

Pennsylvania.

Charles Lukens, On Diseases of the Head from Affections of the Stomach.

Stephen Burson, On Sleep.

Thomas J. Davis, On Hæmoptysis.

Samuel W. Pickering, On the Functions of the Nervous System.

E. Boudinot Stockton, On the Influence of Physical Causes on the Moral Faculty.

Joseph K. Swift, On Rheumatism.

John Harris, On Dyspepsia.

Joseph A. Tate, Account of an Epidemic Dysentery.

Ralph Lee, On the laws Regulating the Temperature of the Body.

James Speer,	On Leucorrhæa.
Charles C. Beatty,	On Hydrocephalus Internus.
Martin Barr,	On Puerperal Fever.
Samuel C. Thornton, . . .	On Instinct.

Delaware.

Goveyneer Emerson, . . .	On Hereditary Diseases.
Nathan L. Boulden, . . .	On Scrofula.
John L. Morris,	On Hydrophobia.

Maryland.

Nathaniel R. Tingle, . . .	On Uterine Hæmorrhage.
Samuel Shuman,	On Dropsy.
John Ridout,	On Pneumonia Typhoides.
James J. Johnson,	On Dropsy.

District of Columbia.

Edmund Fitzhugh,	On Animal Heat.
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Virginia.

Philip W. Spark,	On Eupatorium Perfoliatum.
William G. Nice,	On the External Application of Cathartics.
Peterson W. Harper,	On Cynanche Trachealis.
John C. Pegram,	On the Epidemic of 1815.
William A. O. Brown, . . .	On Typhus Fever.
Alexander Erskine,	On Secale Cornutum.
Thomas N. Cameron,	On Hepatitis.
Joseph Dudley,	On Typhus Fever.
William H. Robertson, . . .	On Specifics.
Wallace Estell,	On Typhus Pneumoniæ.
John G. Crouch,	On Scrofula.
Robert G. Mosely,	On Amenorrhœa.
William R. M'Caw,	On Chronic Aphthæ.
Robert B. Honeyman,	On Dysentery.
Creed Haskins,	On Typhus.
Samuel C. Dickenson,	On Cynanche Trachealis.
John T. Garland,	On the Physiology of the Skin.
M. S. Watkins,	On the Modus Operandi of Blisters.

William B. Price, . . .	On Dysentery.
Ferdinand Stith,	On Bilious Remittent Fever.
Hartwell Harris,	On the Unity of Disease.
Benjamin Wilkins,	On Hepatitis acuta.
Thomas F. Tebbs,	On the Typhous Epidemic of Virginia.
John W. Royster,	On the Croup.
Richard C. Mason,	On Menstruation.
Richard M'Sherry,	On Mortification.
Samuel Scollay,	On Dysentery.
John Cabaniss,	On Sensation and Motion.
Samuel Shrewsbury, Jun.	On Injuries of the Head.

Kentucky.

Daniel M. Heard,	On Animal Heat.
James Metcalfe,	On Hepatitis.
James Wilson,	On Apoplexy.
William I. M'Lees,	On Sea Scurvy.

North Carolina.

Thomas R. Ruffin,	On the Anatomy and Physio- logy of the Egg.
William J. Polk,	On Typhus Fever.
Henry Frost,	On the Cold Bath.
Richard Footman,	On Melia Azederach.
Samuel Wilson, Jun. . . .	On Digitalis.

Georgia.

Milledge Galphin,	On the Sesamum or Benne.
John L. Wingfield,	On Fractures.
Alexander Cunningham, . .	On Intermitting and Remitting Fever.
James Tinsley,	On Diabetes.

Ireland.

David M'Garry,	On Menstruation.
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HUMANE SOCIETY.

Philadelphia, March, 1816.

The following Managers were elected for the present year,
viz.

Joseph Crukshank,	Samuel Pancoast, Jun.
Charles Marshall,	William Leedom,
Benjamin Thaw,	Matthew L. Bevan,
Dr. Thomas C. James,	William Hembell, Jun.
Dr. Joseph Parrish,	Benjamin Jones, Jun.
Dr. John W. Moore,	Isaac Snowden.

The following Officers of the Institution were chosen by the managers.

Joseph Crukshank, *President.*
Joseph P. Hornor, *Treasurer.*
Isaac Snowden, *Secretary*

Inspectors of the Apparatus:
William Hembell, Jun.
William Leedom.

Committee of Correspondence.
Doctor Thomas C. James,
Joseph Parrish,
John W. Moore.

Botanical Garden.

The Subscribers inform the public, that the Trustees of the University of Pennsylvania are taking measures to establish a BOTANICAL GARDEN, in or near the city of Philadelphia. The funds granted them by the Legislature not being adequate, the public are invited to extend their patronage to this interesting and important object.

A *Botanical Garden*, calculated to afford the highest benefit on the Medical School, the greater facilities to the study and improvement of the Science, and recreation to the citizens at large, requires considerable expense in its establishment, as well as in its subsequent maintenance and improvement.

Subscription papers will be presented in a few days, when the subscribers flatter themselves, the *University of Pennsylvania* will be supported in its efforts to form this establishment, which has long been desired, and which, if accomplished, will be of permanent utility to the city.

Extract from the Act of the Legislature.

“ That the sum of *three thousand dollars*, be, and the same “ is hereby granted to the Trustees of the University of Penn- “ sylvania, for the purpose of enabling them to establish a “ Garden, for the improvement of the Science of Botany; and “ for instituting a series of experiments to ascertain the cheap- “ est and best food for plants, and their *Medical properties and “ Virtues.*”

*William Rawle,
Benjamin Chew,
Edward Burd,
James Gibson,
Horace Binney.*

Committee of the Board of Trustees.

Philadelphia, April 10, 1816.



*Transactions of the Literary and Philosophical Society
of New-York.*

A quarto volume of the Transactions of the New-York Literary and Philosophical Society has lately been published. It contains a learned and copious introductory discourse, by the President, Dewitt Clinton, L. L. D.—a Memoir on Comets, by the corresponding Secretary, Hugh Williamson, M. D. and L. L. D.—a Tract on the Laws of Contagion, and the application thereof to Contagious Diseases, by David Hosack, M. D. one of the vice-presidents—Directions for making and registering Meteorological Observations, by John Griscom, Esq. a counsellor of the society—an Analysis of the Mineral Waters at Schooley’s Mountain, in New-Jersey, by professor William J. Mac Neven, M. D.—Cases of Morbid Anatomy, with plates, by John W. Francis, M. D. one of the recording secretaries. This volume also contains a

Memoir on the North-American Earthquakes of 1811, 1812, and 1813, and the cotemporaneous commotions in other parts of the world, by Samuel L. Mitchill; and the Description and Classification of nearly one hundred and seventy species of Fish, found in and around New-York, by the same. This ichthyological paper is illustrated, by Dr. Mitchill, with the figures of sixty species of fishes; the principal of which are supposed to be unknown to naturalists; and which may serve to make inquirers somewhat better acquainted with the variety and abundance found in the market of New-York. In this interesting publication, likewise, will be found, a letter of Dr. Clinton to Dr. Mitchill, containing remarks on the fishes of the western waters of the state of New-York; and a letter from James Mease, M. D. to Dr. Hosack, concerning the history, haunts, and manners of the Rock-fish, Striped Basse or streaked Perch, of the United States.

Mineralogy and Geology.

There is now in the press of Cummings and Hilliard, of Boston, an elementary treatise of Mineralogy and Geology, in one volume, of between six and seven hundred pages, by Professor Cleaveland of Bowdoin College. The work will be accompanied with plates, illustrating the structure and actual forms of crystals, and a geological map of the United States.

The work is more especially designed for pupils, for gentlemen attending mineralogical lectures, and also as a companion for travellers; for which purpose, particular attention has been devoted to the designation of all the localities of minerals in the United States. A work of this kind is much wanted, for the assistance of those who are disposed to engage in the study of this useful and interesting science. From the abilities and application of Professor Cleaveland we have no doubt that this work will be executed in a manner to merit the public patronage, which it may be hoped will remunerate him for the study and labour it has required.

Speedily will be published in 2 vols. 8vo. the Institutes and Practice of Medicine, founded on the basis of anatomy, healthy and morbid; and on the well known Laws of the Animal Economy; by Lyman Spalding, M. D. President of the College of Physicians and Surgeons of the University of New-York, for the Western District.

Phosphorus internally used as a Tonic and Stimulant Remedy.

Monsieur D. Lobstein, of the Faculty of Medicine of Paris, has published an historical essay on the discovery of the physical and chemical properties of phosphorus, which is by him now classed among the articles of *Materia Medica*, with the doses, medical effects, and formulæ.

He attributes the unfortunate experiments formerly made of that substance in the human body, to the improper mode that was resorted to for its exhibition in pills, electuaries, &c. in which it could not be sufficiently divided or diluted. But its solution in vitriolic æther, with the addition of some distilled aromatic oil, is an equally safe and convenient medicine, to be taken at the dose of a few drops at first, to be gradually augmented as the circumstances may require. As a powerful tonic, it becomes eminently useful in asthenic diseases, in which it is desirable to diffuse a momentary, but intense stimulating action. He mentions dangerous cases of typhus and other asthenic fevers, thus radically cured by the use of phosphorus. His *reviewers* express a regret that the association of that ingredient with different auxiliaries, should make it difficult to determine upon its true efficacy. They, however, think the subject highly interesting, and well deserving further experiments.—*Journal de Medicine de Paris*, May, 1815.

OBITUARY.

Lancaster, Penn. April 6, 1816.

Died on the 1st instant, DR. FREDERICK KUHN, in the sixty-ninth year of his age.

He was born in this borough, on the 24th of August, 1748. He was early instructed in the principles of the christian religion, which he professed through life, and adorned by his conduct.

He obtained a polite and liberal education, went through the regular gradations of the schools, graduated as Doctor of Medicine, and rose to a degree of eminence in the profession, to which a sound judgment and uncommon application alone can elevate.

At the opening of the revolutionary war, he engaged in the service of the United States, and therein continued almost throughout the war, among the most eminent and respected of his profession in the army.

When he withdrew from the public service, he made the place of his birth his place of residence and medical practice.

After the establishment of the present Constitution of this Commonwealth, he was appointed one of the judges of the county; and served in that capacity for a number of years, to the satisfaction of the community.

In the practice of Medicine, he was eminent and fortunate. He was universally respected and beloved. His tenderness of the character of others, ensured him the friendly regard of his professional brethren. His diligent attention to those who committed their health to his care, his charity to the poor, his kindness to the afflicted, the amiableness of his disposition, together endeared him to all his neighbours.

Note on the Remarks of the Editors' friend, respecting the Self-Registering Thermometer.

As the scale of the Thermometer must necessarily be adjusted under the "general attraction of magnetism," the only effect on its accuracy will be the variation of the force of this general attraction, which, since its quantum cannot be measured by the nicest experiments, will, I apprehend, be too inconsiderable to sensibly affect its accuracy.

In the experiments I made, the small hands *G. G.*, were not used, but their place was supplied by a very small wire ring, which moved with such ease as to produce no apparent resistance; from this circumstance, if the magnetic needle come nearly in contact with the glass tube, and the iron ball be about four lines in diameter, I think very delicate hands will journey so as to answer the same purpose.

E. C.

ERRATUM, in pages 250, 251, & 252, for 'index,' read *scale*.

THE
ECLECTIC REPERTORY
AND
ANALYTICAL REVIEW.

VOL. VI.

JULY, 1816.

No. III.

SELECTED PAPERS.

Observations on the Application of Coal Gas to the Purposes of Illumination. By WILLIAM THOMAS BRANDE, F. R. S. L. and E. Prof. Chem. R. I. &c.

[From the Journal of Science and the Arts, No. I. 1816.]

THE employment of the gases evolved during the destructive distillation of common pit coal for the illumination of streets and houses, is a subject of such intrinsic and increasing importance, as to render some account of its progress and improvement a proper subject of discussion in this Journal.

That coal evolves a permanently elastic and inflammable aeriform fluid seems first to have been experimentally ascertained by the Rev. Dr. Clayton, and a brief account of his discovery is published in the Philosophical Transactions for the year 1739. The following is an extract from his paper. "I got some coal, and distilled it in a retort in an open fire. At first there came over only phlegm, afterwards a black oil, and then likewise a *spirit* arose, which I could no ways condense; but it forced my lute, or broke my glasses. Once when it had forced my lute, coming close thereto in order to try to repair it, I observed that the spirit which issued out caught fire at the flame of the candle, and continued burning with violence as it issued out in a stream, which I blew out and lighted

again alternately, for several times. I then had a mind to try if I could save any of this spirit, in order to which I took a turbinated receiver, and putting a candle to the pipe of the receiver whilst the spirit arose, I observed that it caught flame, and continued burning at the end of the pipe, though you could not discern what fed the flame. I then blew it out, and lighted it again several times; after which I fixed a bladder, squeezed and void of air, to the pipe of the receiver. The oil and phlegm descended into the receiver, but the spirit still ascending blew up the bladder. I then filled a good many bladders therewith, and might have filled an inconceivable number more, for the spirit continued to rise for several hours, and filled the bladders almost as fast as a man could have blown them with his mouth: and yet the quantity of coals distilled was inconsiderable.

“ I kept this spirit in the bladders a considerable time, and endeavoured several ways to condense it, but in vain. And when I had a mind to divert strangers or friends, I have frequently taken one of these bladders, and pricking a hole therein with a pin, and compressing gently the bladder, near the flame of a candle, till it once took fire, it would then continue flaming till all the spirit was compressed out of the bladder: which was the more surprising, because no one could discern any difference in the appearance between these bladders, and those which are filled with common air.

“ But then I found that this spirit must be kept in good thick bladders, as in those of an ox or the like; for if I filled calves’ bladders therewith, it would lose its inflammability in twenty-four hours, though the bladders became not relaxed at all.”

But the application of the gas thus generated to the purposes of economical illumination, is of much more recent date, and the merit of introducing it is principally due to Mr. Murdoch, whose observations upon the subject are published in the *Philosophical Transactions* for 1808. He first tried it in Cornwall, in the year 1792; and afterwards in 1798 established an apparatus upon a more extended scale at Boulton and Watts’ foundry at Birmingham; and it was there that the first public display of gas lights was made in 1802, upon the occasion of the rejoicings for peace. These, however, were but imperfect trials,

when compared with that made in 1805 at Messrs. Philips and Lee's cotton mills at Manchester; and upon the results of which, all subsequent procedures, with regard to gas lighting, may be said to be founded. The whole cotton mill, with many adjacent buildings, were illuminated with coal gas to the exclusion of lamps, candles, and other sources of artificial light. Nearly a thousand burners of different forms were employed; and the light produced was estimated equal to that of 2500 well managed candles of six to the pound.

The most important and curious part of Mr. Murdoch's statement, relates to the cost of the two modes of lighting (namely, by gas and candles,) per annum. The cost of the coal used to furnish the gas, amounting annually to 110 tons, was 125%. Forty tons of coals to heat the retort, 20%. and the interest of capital sunk, with due allowance for accidents and repairs, 550%. From the joint amount of these items, must be deducted the value of seventy tons of coke, at 1s. 4d. per cwt. amounting to 93%. which reduces the total annual expense to 602%; while that of candles to give the same light, would amount to 2000%.

Such was the flattering result of the first trial of gas illumination upon a tolerably extensive scale. In regard to its efficacy, we are informed by Mr. Murdoch, that the peculiar softness and clearness of the light, with its almost unvarying intensity, brought it into great favour with the work people; and it being free from the inconvenience of sparks, and the frequent necessity of snuffing, are circumstances of material importance, as tending to diminish the hazard from fire, to which cotton mills are so much exposed.

When Mr. Lee was examined by Mr. Brougham, in 1809, before a committee of the House of Commons, against the Gas Light and Coke Company's bill, his evidence was then equally favourable. He said, it gave no disagreeable smell; and when questioned as to the purity and goodness of the light, "I burn it," said he, "every night in my own house, instead of thirty pairs of candles." He further added, that he found it perfectly wholesome, and that it was never complained of either in his own dwelling house, or in the mill.

The President and Council of the Royal Society proved the

high opinion which they entertained of the value and importance of Mr. Murdoch's communication on the employment of the gas from coal for the purpose of illumination, by adjudging to him Count Rumford's gold and silver medals.

To prove that gas is economically applicable upon a small as well as a large scale, reference might be made to Mr. Cook's statement in the *Phil. Mag.* Dec. 1808, which, with some other amusing particulars, is noticed in the *Edinburgh Review*, vol. XIII. page 477.

I have thought it right to state these particulars concerning the earliest trials of gas lights: and now, without adducing further evidence from those remote sources, shall proceed to information gained at the establishments lately instituted in the metropolis; and to that afforded by my own experiments. The apparatus required for gas illumination, consists of retorts for the distillation of the coal, of condensers for the reception of the tar and ammoniacal liquor, of purifiers containing cream of lime, through which the gas passes, and is freed from carbonic acid and sulphuretted hydrogen; of gasometers or reservoirs with their main conduit pipes, and of the burners with their tubes and stop-cocks. Of the construction and expense of the whole of this apparatus, a tolerably correct estimate may be formed by consulting Mr. Accum's "*Practical Treatise on Gas Light.*"

We are indebted to Dr. Henry, of Manchester, for some valuable researches, concerning the composition of the aeriform products of several varieties of coal. (*Phil. Trans.* 1808.) He has pointed out the various composition of the gas at different periods of the distillation, and has shewn the important influence of the circumstances under which the coal is distilled, upon the proportion of gas yielded, and its fitness for the purposes of illumination. This fact has lately attracted the notice of Mr. Clegg, the engineer of the Gas Light Company, who has founded upon it several ingenious improvements in the construction of the retorts employed at the Westminster gas works. Coal in large heaps, and gradually heated, affords less gas and more water and tar, than when it is extended over a considerable surface, and suddenly brought to a red heat. It

is also very advantageous to dry the coal before its introduction into the retort.

In a small gas apparatus, erected in the laboratory of the Royal Institution, we find that 4 lib. of good Newcastle coal, introduced into the retort previously heated red, in a shallow iron pan, may be made to afford a produce of from twenty to twenty-six cubic feet of gas, consisting of

- 8 Olefiant gas
- 72 Carburetted hydrogen
- 13 Carbonic oxide and hydrogen
- 4 Carbonic acid
- 3 Sulphuretted hydrogen

100

The carbonic acid and sulphuretted hydrogen are separated by the lime in the purifiers.

The same quantity of coal introduced into the cold retort and gradually heated, afforded only twenty-two cubic feet of gas, consisting of

- 5 Olefiant gas
- 70 Carburetted hydrogen
- 18 Carbonate oxide and hydrogen
- 6 Carbonic acid
- 1 Sulphuretted hydrogen

100

The specific gravity of the former gas, that of air being = 1000, was = 560, and of the latter = 555: the fitness of gases for the purposes of illumination is, generally speaking, directly as their specific gravity.

These experiments lead to the conclusion that a chaldron of good Wallsend Newcastle coals would afford from 17,000 to 20,000 cubical feet of gas, but the process of distillation as now carried on in the large establishments for lighting the metropolis seldom affords a larger average produce than 12,000 cubical feet. There can, however, be little doubt, that by improvement in the construction and management of the retorts, the highest of the above averages might be procured; and calculating upon this produce of gas, and upon the other substances

yielded by the operation, we obtain a curious and striking result.

The average value of a chaldron of the best Newcastle coals is = 3*l*. The value of the products of its distillation is as follows:

	<i>l.</i>	<i>s.</i>	<i>d.</i>
11 $\frac{1}{4}$ chaldron of coke, at 31 <i>s.</i> - - - - -	1	18	9
12 gallons of tar, at 10 <i>d.</i> - - - - -	0	10	0
18 gallons of ammoniacal liquor, at 6 <i>d.</i> - - - - -	0	9	0
20,000 cubic feet of gas, at 15 <i>s.</i> per 1,000 cub. feet, 15	15	0	0
	<hr/>		
	1.	17	9
	<hr/>		

From the value of products must of course be deducted the value of the common coal employed in the furnaces for heating the retorts, amounting to about five chaldrons for every five and twenty chaldrons submitted to distillation, and the expense incurred by wear and tear, with the wages of the labourers, and lastly, the interest upon capital. Mr. Murdoch's estimate, already quoted, will be found pretty accurate upon these heads.

The tar is frequently employed for the production of gas, either by mixing it with small coal in the retorts, or by passing it through a red hot tube. Every pound yields between seventeen and eighteen cubic feet, containing from fifteen to twenty per cent. olefiant gas. When, therefore, it has been cleansed by lime, it burns with a very brilliant flame, and is a most improving addition to the common gas. Wigan and Cannell coal yield the best and largest proportion of gas for the purposes of illumination, but it is seldom it can be employed on account of its high price.

The burners, or tubes whence the gas issues for combustion, may be infinitely and tastefully varied. The varieties commonly employed are the bat's-wing burner, and the Argand burner. The former consists of a brass tube having a slit at its extremity about a quarter of an inch long and one-fortieth of an inch wide. The latter is composed of two concentric brass tubes about two inches long, closed at bottom by a ring of brass, and at the top by one of steel perforated with sixteen or eighteen holes of one-thirtieth of an inch in diameter. The gas

enters the cavity between the tubes, and issues from the circular row of apertures, where it is inflamed, and having a due supply of air within and without, burns very beautifully when a proper glass is placed over the burner. These burners, when very carefully regulated, consume about three cubical feet of gas per hour, and give light equal to that of six wax candles; but it is requisite, on account of carelessness and mismanagement, to allow four cubical feet to each burner per hour. The bat's-wing burner should not consume more than three cubic feet per hour.

At the three stations belonging to the chartered Gas-light Company, situated in Peter-street, Westminster, in Worship-street, and in Norton Falgate, twenty-five chaldrons of coals are carbonised daily, which actually yield 300,000 cubical feet of gas, equal to the supply of 75,000 Argand's lamps, each lamp giving the light of six wax-candles. But if the full proportion of gas were obtained, viz, 20,000 cubical feet from each chaldron of coals, then the produce should be 500,000 cubical feet, equal to the supply of 125,000 lamps of the same size, and the light afforded should equal that of 750,000 wax candles, instead of 450,000, which is the real produce.

At the City gas-works, in Dorset-street, Blackfriars-bridge, the daily consumption of coals, for distillation, amounts, at present, to three chaldrons; which afford gas for the supply of 1,500 lamps, so that the total consumption of coals daily in London, for the purpose of illumination, amounts to twenty-eight chaldrons, and the number of lights supplied to 76,500.

Besides the different varieties of coal, some of which, as has been hinted, are much preferable to others, and coal-tar, an useful gas may be procured from a variety of other substances; and in the laboratory of the Royal Institution we often feed the retort with waste paper, saw-dust, pieces of wood, &c. and consume the gas for a variety of purposes, where oil was formerly employed.

The following are the results of some experiments upon these subjects, compared with the produce from coal.

1. The retort was charged with four pounds of coal. The quantity of gas amounted, after having passed the purifiers, to

twenty cubic feet. The coke remaining in the retort weighed 2 lb. 8.7 oz.

The heating power of the gas flame was compared with that of a wax candle, by ascertaining the time required by each to raise two ounces of water, in a thin copper vessel, from 55° to 212° . The flames were made as similar in dimensions as possible, and so placed that their points just touched the bottom of the vessel. The heating power of the candle being assumed as $= 1$. that of the coal gas flame was $= 1.5$.

2. Four pounds of the dried wood of the common willow yielded sixteen cubical feet of gas, and fourteen ounces of charcoal remained in the retort. The gas burned with a very pale blue flame, and was unfit for the purpose of illumination, and contained no olefiant gas.

3. Four pounds of the wood of the mountain ash afforded fifteen and a half cubical feet of gas, and thirteen ounces and a half of charcoal. The flame was very pale and blue.

4. Four pounds of white birch wood gave fourteen cubical feet of gas and twelve ounces of charcoal. The flame similar to 2 and 3.

5. Four pounds of hazle wood yielded thirteen cubical feet and a half of gas, and twelve and a half ounces of charcoal. Its heating power was $= 1.2$. It burned with a better flame than 2, 3, and 4, but the intensity was not sufficient for any useful purpose of illumination.

6. Four pounds of writing paper gave eighteen cubical feet of gas, and the remaining charcoal, which beautifully retained the form and texture of the paper, weighed eleven ounces and a half. The heating power of the gas was $= 1.6$. It burned with a flame nearly approaching, in illuminating power, to that of coal gas.

These experiments, along with others which it is thought unnecessary to notice, prove that the gas from woods is not fit for the purposes of illumination, although, as evolved during the production of charcoal, it may conveniently be consumed in the laboratory as a source of heat.

Respecting the advantages of gas illumination in streets, open places, large manufactories, &c. there can be but one opinion; but its introduction into dwelling-houses involves some more

important considerations. It may be urged in its favour, that the light is more equable, beautiful, and agreeable to the eye than that obtained from any other source; that superior cleanliness is attained, and the troublesome operations of filling and trimming oil lamps are superseded; that there is no danger from sparks and snuffs, as where candles are employed, and that by closing the main pipe of supply, a certain extinction of all the lights throughout the building is insured.

The following are the principal objections that have been adduced. When the gas escapes unburned, its smell is extremely disagreeable, and this may happen either from some fault in the pipes or burners, or from a stop-cock connected with a burner being accidentally left open. In the latter case the remedy is obvious, but in the former the escape of gas may prove very troublesome; but it may be guarded against by employing double pipes, by carrying them as much as possible upon the exterior of the house, and above all, by employing careful and good workmen in the construction of every part of the apparatus.

The idea of explosions, in rooms lighted by gas, has frequently occurred; but when the probability of such an event is calmly considered, much of the alarm that it has excited must vanish. For the formation of an explosive atmosphere, a large quantity of gas must escape into an apartment which must be nearly air-tight; and in a room with an open chimney, and two or three doors and windows, it would scarcely be possible to obtain a dangerous mixture, though it might occur in a cellar or any other very small and close apartment. In a dwelling room the gas would announce itself by its smell, very long before any dangerous mixture could ensue, and the quantity of gas required would be very great. A room twelve feet square, or containing 1728 cubical feet of atmospheric air, would require an addition of 247 cubical feet of coal gas to render its atmosphere explosive. If we suppose a large Argand's burner accidentally left open in this apartment, whence gas is flowing at the rate of 4 cubical feet per hour, it would require 62 hours for the above quantity of gas to flow into the room, which also must be *nearly* air-tight; these circumstances can scarcely be supposed ever to occur; a very little attention to ventilation,

which whenever gas is used should be strenuously insisted on, would remove all possibility of danger. But the best proof of the safety of gas illumination is, that notwithstanding the many thousand lamps nightly burning in London, six* accidents only are known to have occurred, and those of a very trifling and almost unimportant nature, though the pipes and lamps are generally badly and very carelessly managed. In matters of this kind, facts, and not arguments, must be looked to for evidence.

It was my intention to have concluded this paper with some observations on the construction of burners, and with an account of several important improvements lately made in the general apparatus by Mr. Clegg: the hope of rendering my account of these subjects more correct and perfect than is at present in my power, induces me to defer it till the appearance of the next number of this Journal.



Observations on the Nature and Properties of Caoutchouc, and on the Construction of Elastic Beds, Pillows, Hammocks, &c.

[From the London Monthly Magazine, for March, 1816.]

THE term *Caoutchouc* may be considered as the *generic name* for a concrete vegetable substance which possesses the properties of elasticity and extensibility, and is soluble in the essential oils, &c.; and its not being acted on by those fluids which are solvents for gums and resins, renders the term *elastic gum*, or *elastic resin*, improper for it. The *specific name* may be that of the vegetable producing it: as, *caoutchouc* of *Urceola elastica*, *caoutchouc* of *Ficus indica*, *caoutchouc* of *Artocarpus integrifolia*, &c.

This production is common to the East-Indies, and to all tropical climates, from whence it is imported in various artificial forms; chiefly in that of bottles and solid blocks; sometimes in the shape of balls, or in the rude figures of birds, horses,

* Two of these arose from holes having been mischievously bored in the pipes of supply.

and other animals. It grows very abundantly in South America, particularly on the banks of the Amazon river, eastward of Quito; also in the colonies of Surinam and Cayenne, in Guiana; and has been found plentifully in Brazil, and in small quantities near Buenos Ayres, and beyond the river Plata at near 40 degrees South latitude, or 16 degrees beyond the tropics: so that it may possibly be propagated in Spain, or in the South of France, as these are both situated under the corresponding degree of North latitude: and there are some English trees and plants affording a white juice, which, if collected in sufficient quantities, may possibly produce by coagulation a similar elastic substance.

Caoutchouc, as an article of commerce, is of comparatively modern introduction; its uses have been locally confined, and but little known; whilst its great abundance, and the easy mode of its being obtained and applied, renders it an advantageous subject of general investigation: and the principal object herein is to collect and arrange a series of well authenticated facts relating to it; and, from the inferences deducible therefrom, to elucidate and confirm the advantages of its application to numerous and more extensive purposes. I have therefore subjoined abstracts from the accounts of M. de la Borde, physician at Cayenne, in Guiana, &c. and also from the following works:

Linnæus. *Spec. Plant.* SIPHONIA CAHUCHU.

—— *Suppl.* JATROPA ELASTICA.

Aublet. *Guian.* II. Pl. 335. HEVEA GUIANENSIS.

Annales de Chimie. 1792.

Act. Par. 1751. Pl. 20, *figura mala.* PAO XIRINGA.

Nouv. dict. d'Hist. Nat. IV. p. 308. Pl. B. 1. *fig.* 4.

Asiatic Researches, Vol. 5. ELASTIC GUM VINE, URCEOLA ELASTICA.

Encyclopedia. Nicholson. CAOUTCHOUC.

—— *Londinensis.* CAOUTCHOUC, URCEOLA ELASTICA.

General Review of Foreign Literature, 1775.

Repertory of Arts, CAOUTCHOUC.

Chemic. Dict. Nicholson. CAOUTCHOUC.

Acropedia. Baldwin. COCHUC.

The French naturalists mostly call this substance Caochouch:

M. Bomare describes it under the name of *Resin elastique*. The *memoires de l'Academie des Sciences*, 1751, contain a description of it by M. de la Condamine, and two papers on the manner of softening and dissolving it, by M. Macquer, and Herissant, 1763; also some observations by M. Macquer, 1768, on the caochouch discovered in Cayenne; and in the same publication for 1769, there are remarks by the Chevalier Turgot on the elastic resin found in the Isle of France. The trees, vines, and plants, of different climates, producing it, are numerous, and of various sorts.

The vegetable substance of *caoutchouc* or *elastic gum*, as produced from the tree or vine in its native climate, cannot be imported in its original fluid state, on account of a spontaneous fermentation which would take place, and ultimately render it useless. It is technically called Indian rubber, lead eater, &c. from its being an Indian production, and chiefly used for the purpose of erasing the strokes of black-lead pencils, an inherent property for which it appears exclusively to possess. It is the indurated juice or sap of a tree; and is extracted from incisions made in the bark or otherwise by cutting off whole branches. The fluid, when first exuded, is of a white colour, and of a glutinous consistency, soon acquiring a firm texture by exposure to the air; after which its colour gradually changes to a dark brown or black, which penetrates more or less deep beneath the surface, according to its age and thickness. It is pliable, extensible, and elastic to a remarkable degree; being capable of great extension in any direction, and afterwards of regaining nearly its former size and shape, on the extending force being withdrawn. A great degree of cold renders it stiff and rigid. A moderate warmth restores its original elasticity, renders it more pliable, and increases its capability of extension. A violent heat destroys it by melting; producing at the same time a dense smoke. If the heat be increased beyond this, ignition takes place, when it burns slowly with a bright flame; and on this account it has been used for torches.

All its qualities are permanent excepting its white colour, and its original vegetable odour, which much resembles that of Chinese or Indian ink. Its specific gravity is rather less

than that of water. It is, in its *original fluid state*, capable of being moulded or formed into *any requisite shape*, impervious to air and water; and it appears to be indestructible excepting by fire, and by its known solvents of nitric ether, essential oil of turpentine, &c. Water, or the generality of oils, will not dissolve it unless at a very high temperature.

When reduced to a fluid, either by melting or by solution, it is not easily restored to a solid form, and most of its original properties are lost; excepting when nitric ether is employed, which completely dissolves it at the common temperature of the atmosphere: and if the solution be afterwards spread on the surface of paper or clay, &c. and exposed to the air, the ether soon evaporates, leaving the caoutchouc unaltered in its properties. This solution is transparent, of an amber colour; and, on being thrown into water, rises to the surface, forming a solid membrane, possessing the great elasticity and the other qualities of original caoutchouc: but, as the ether requires much expensive preparation, with longer time than the other solvents, this method for most purposes is not eligible. Essential oil of turpentine is a solvent for it, with the application of a small degree of heat. If the caoutchouc bottles are cut into small pieces, and those pieces are examined a few hours after their immersion into this solvent, they will be found to be considerably augmented in their size by absorbing the turpentine; and rendered so transparent, that all the different layers, strata, or coatings of which the bottles, and other artificial figures of elastic gum are constructed, may easily be seen through the edges of the flat pieces: this solution may be completed in about four days, by repeatedly straining it by force through cloth or hair bags. If pieces of paper or of silk or cotton-cloth, previously saturated with linseed oil and dried, be immersed in this solution, and afterwards exposed to the air, the turpentine evaporates, leaving the oil-case completely covered with the caoutchouc, possessing a remarkable degree of adhesiveness and tenacity; so that if two or more such pieces be laid over each other, and pressed together to expel the air between them, they will unite with great firmness; and, if afterwards torn asunder, they will appear to have been held in contact by numerous strings or fibres of the elastic gum on

their surfaces. Several pieces of silk, cotton, or paper oil-case, may thus be joined together to any size and shape; forming a resemblance to paste-board, flexible, and impervious to air. Compositions, for careening the balloons of aerostation, are made of elastic gum, digested in essential oil of turpentine, and afterwards dissolved by boiling it in drying linseed oil, in various proportions. A piece of indurated caoutchouc possesses an inherent toughness, resisting the edge of any sharp instrument; but if required to be cut, it may be done in any direction by making it rather warm, to increase its flexibility sufficiently to bend it over the edge of a table, and applying the sharp point of a knife to its strained surface.

The trees or vires producing caoutchouc, are numerous, and not confined to one species; but they are chiefly of the genus *EUPHORBIA*, 3d section, 11th class, *Linnaeus*. Those which are found in Bengal, particularly near the mouths of the Ganges, mostly resemble the English ivy, bearing leaves at the extremities of the small branches only. The largest stems are from four to six inches in diameter, proceeding in numerous ramifications on the ground, until they meet with other support; when they ascend, and frequently bind several trees together in the numerous folds of their branches: these growing over them descend, and again take root in the ground, from whence other ramifications of stems proceed in the same manner as before. This property of taking root in numerous places is common to many English trees and plants, when suffered to grow naturally and without mutilation.

The common method of extracting the gum from the caoutchouc trees, is either by incision or by cutting off whole branches. The first method is usually preferred, and is the most easily performed; being nothing more than cutting several deep gashes through the bark, and placing shells round the tree in any convenient manner to receive the gum. The second method is injurious to the trees, but produces the greatest quantity; being sometimes more than one third of the whole weight of the amputated branches or stems: these are cut into convenient lengths, and set standing on their ends in the receiving vessels, until a sufficient quantity is collected from them. To form the caoutchouc bottles which are com-

monly imported, a ball of clay is fixed on the extremity of a stick, and repeatedly dipped into the extracted fluid. Each coating requires a short time to dry and harden, by exposure to the air or to the sun; and several such coatings produce the requisite thickness; after which the stick is withdrawn, and the clay is broken and washed out: others are formed wholly on clay. On opening some of these bottles, the remains of clay, and also the shape of the stick, may be observed in them. Their general size is from two to eight inches in diameter; their outside surfaces are either left plain, or indented, before they are perfectly indurated, with various figures, which afterwards remain indelible. They are also equally capable of receiving any kind of raised or embossed work, by the addition of small pieces of the gum to their surfaces, whilst in the same state. These bottles and all hollow figures of animals, fruit, &c. are thus molded or formed on models of clay, excepting the smaller parts of them, which are made by coating short pieces of twine or other substances with the fluid gum, and adding them to the figure before its surface is perfectly indurated.

The thick blocks of caoutchouc are made in moulds of clay; and sometimes merely by digging trenches or holes in the ground near the trees, and causing the extracted gum to flow into them, wherein it gradually indurates: and commonly so little care is taken during the process, that pieces of clay, with dry sticks, grass, and leaves, are sometimes found in the midst of their substance; and also small cavities partly filled with the juice in a fermented state; others are nearly free from these imperfections. They are generally from one to three feet long; and about two inches thick; having much of the appearance of cork. For the purpose of erasing the strokes of black-lead pencils or crayons, small pieces of these blocks are preferable to the bottles or to any other shape, being more durable and convenient. A new block on being cut appears white internally, and the more so toward the centre; but this original white colour will not remain on its surface, where it is in immediate contact with the air, longer than a few days; yet, after the dark shade has penetrated about an eighth of an inch deep, it requires a much longer time to penetrate farther.

Of the Syringe tree, *Siphonia cahuchu*, or *Siphonia elastica*, an account is obtained from the observations of M. de la Borde; who, when travelling by the order of the French government through the interior of Africa, A. D. 1772, found several of them growing on the banks of the lakes and rivers. Those in the woods are not readily observed, from their tufted branches being much intermixed with the surrounding foliage; but they may be distinguished by the number of young plants produced by their falling seeds, and springing up beneath them: these, being overshadowed by the forests, are mostly prevented from growing to maturity. The resinous juice flows at all times of the year; but the rainy season is the most favourable for collecting it; and the natives generally prefer this time for the purpose. They begin the operation by washing the stem of the tree to the height of seven or eight feet, to free it from moss, &c. and perhaps to make the gum flow more readily. A cord is then bound round the trunk at the height of about one foot from the ground, to support a trench or gutter, which is made of clay with a short spout projecting off at one side of it; under which is placed a calabash shell, or a hollow shaped piece of clay, to receive the gum. Several deep gashes are then cut through the bark, to the height of five or six feet; and the white juice exuding therefrom, flows around the trench, and runs down from the spout to the receiving vessel; into which the clay-models, of any requisite shape, are afterwards dipped repeatedly, until their surfaces have acquired by induration a sufficient thickness, or number of coatings. After the process is finished, the substance remains extremely flexible, and nearly insoluble: warm water, or a moderate heat, softens it, and makes it more pliable, but never renders it capable of being remoulded.

The Syringe tree is also a native of South America: in Brazil it grows to the height of fifty or sixty feet; generally straight and free from branches, excepting at the top, where they are numerous and much divided; its leaves are green on the superior surface, and white beneath, growing three together on the same leaf stalk; the seeds are contained in pods, each consisting of three cells, resembling those of the *Ricinus* or *Palma Christi*. Amongst others, M. Aublet has noticed its

fruit, and the white and resinous juice produced from its trunk; and a botanical description of its flowers has been given by M. Richard, a French botanist. In the forests to the north of Quito, where it is found in great abundance, the inhabitants have given it the name of *Heve*. From incisions purposely made in the bark, there exudes a white fluid resembling milk, which gradually hardens in the air: of this they make torches or flambeaux; and in the province of Quito, they render a kind of coarse cloth water proof, by covering it with a thin coat of the fluid caoutchouc, which soon indurates thereon; and it thus answers the common purposes of oil-case. On the banks of the Amazon river, the natives form the gum into rude figures of birds, fruit, and toys of different kinds, which are not easily broken. For making them they employ clay models: these are covered with one layer or coating of the gum, and exposed to the smoke of a fire until its white colour changes to a deep yellow: the same operation is repeated until it is brought to a proper thickness. When that is done, and it is become sufficiently indurated, the models are crushed by pressing together the sides of the hollow figure, and afterwards washed out. In this manner they form elastic bottles, and also shoes and boots, which in texture and colour much resemble those made of leather, and they possess the additional advantage of being impervious to water.

The nation of Omaguas, situated in the interior of South America, also form the caoutchouc into bottles, to the necks of which they fasten a hollow reed, and thus convert them into a sort of syringe. From this circumstance the Portuguese of the colony of Para, have called the tree *Pao de Xiringa*; and hence the name of *Seringat* has been given to it, and also to its resinous production. The wood of this tree has been wrought into small masts, it being both light and straight. There are other trees in South America producing a white juice, which may be converted into similar articles with those made from the common caoutchouc or syringe tree; although the quantity of juice, produced from them, and also its quality, may be various. M. Fresneau observes, that the elastic gum produced in the colony of Cayenne, indurates very quickly after it exudes from the tree, so that it can be formed into the

requisite shapes only at the places where it is produced; that it is applied to a great variety of uses, and is applicable to many more; and therefore may become of considerable value to the colony by converting it into regularly saleable articles.

From the preceding abstracts, it is clearly evinced that the substance of *caoutchouc* is *elastic, flexible, impervious to air and water*, and of a fibrous texture, not easily separated or destroyed; yet, in *its natural fluid state*, capable of being spread on cloth, paper, cordage, &c. or of being moulded or modelled on clay or wax *into any requisite shape*; and is easily obtained in the most *abundant quantities* in the various places from whence it is commonly imported.

These qualities and circumstances combined, and thus practically obtained, are all that are required in the proposed method of constructing elastic Beds and Pillows, Portable Tent-beds, Seamen's Hammocks, water-proof Life-preservers, &c. comprising flexible and impermeable cases, occasionally enclosed in external cases of the usual construction and appearance, and capable of being filled with atmospheric air, instead of down or feathers, for the purpose of being rendered more or less elastic; and also for obtaining an equal and natural temperature, and other obvious advantages of lightness and portability, buoyancy, &c. resulting from the foregoing method of construction. From the preceding abstracts it is also apparently evinced, that such a manufactory can be established with advantage *only at the places where the fluid caoutchouc is produced immediately from the trees*, unless some eligible method can be found either *to import it in this natural fluid state*, or otherwise *to dissolve the indurated caoutchouc without destroying its essential qualities.*

In addition to the present purpose, the *impermeable cere-cloth*, which has been made of various materials coated with this vegetable substance, may be advantageously applied to the numerous purposes of *leather* and of *flexible oil-case*. It may be made of any size and shape, without seams of thread, and either elastic or not, according to the nature of the cloth or other material which is made the basis of the work. It may be employed for covering chests, trunks, portmanteaus, &c. and more particularly the roofs of coaches. A thicker and

stronger sort may be made into thongs, straps, and traces, carriage harness, saddles, reins, and bridles: these would have the usual appearance of leather, and possess all the utility of it, with the advantage of the more durable properties of caoutchouc, either with or without its elasticity, as may be required; and they may be made entire, without seams of thread in any part: for, if two or more pieces of indurated caoutchouc, which are required to be brought in contact with each other, are pressed together, having some of the same substance *in its natural fluid state* previously applied to their surfaces, they will soon become equally inseparable with any other part of the work, as the fluid readily indurates between them; and, by means of additional external coatings, every appearance of the line of contact may be effectually closed. This is exemplified in the construction of some of the artificial figures of caoutchouc which are commonly imported. And, by the same means, combined with those before mentioned, various instruments, either wholly or in part, may also be constructed, particularly for hydrostatic and hydraulic purposes: as flexible tubes, of various diameters, for conveying air or water; the flexible parts of bellows of every description; some kinds of chemical and surgical instruments. Also water-proof shoes and boots; aprons and entire dresses for workmen employed in chemical laboratories, &c. And hereby considerable improvement may be made in the construction of *valves* and *concave packings*, for the pistons of hydraulic presses, forcing pumps, and condensers; also in the construction of machines of aërostation; for the entire coating of which, with all their appendages, caoutchouc may be advantageously employed, from its superior strength in proportion to its weight, and from its durable, impermeable, and elastic properties. Different sorts of twines and ropes have been coated with it to various degrees of thickness, whereby they have been strengthened, and rendered considerably more durable; and therefore ships' cordage may be more permanently preserved from decay, if thus coated with a firm, dry, flexible, and impermeable substance, than by means of any of the resinous productions which are commonly employed. And, on further investigation, it will be evinced that *caoutchouc, in its natural fluid state, is not only*

advantageous in its application in these examples, and in others which may occur, but also, that in *some instances*, it is the only substance which can be obtained *possessing all the qualities requisite for the purpose*.

J. CLARK.

Bridgewater, Dec. 4, 1815.

On Vaccination in Hindostan.

[From Forbes's Oriental Memoirs, Vol. III.]

THE English have introduced the blessings of vaccination among all descriptions of people in Hindostan; by which means the lives of thousands, and tens of thousands, are annually preserved. In this humane undertaking, the Brahmins have risen superior to prejudice, and, under their extensive and powerful influence, all other casts of Hindoos have adopted the practice. Many letters on this subject from eminent Brahmins to medical gentlemen in India, do them honour; they contain the most liberal sentiments, and have been followed by a corresponding practice. *Mooperal Streenivasachary*, a Brahmin, thus writes to Dr. Anderson, at Madras, on vaccine inoculation:

“ I beg leave to observe, for the information of the natives of this country, that I have perused the papers which you have published on that wonderful, healthful, and immortal vaccine matter, discovered on the nipple and udders of some cows in England, by that illustrious physician Dr. Jenner; whereby the loathsome, painful and fatal Small-pox has been prevented from seizing the many of our fellow creatures in India, as well as in Europe.

“ I am an eye-witness, as well as many others, that numbers of children here have been inoculated with vaccine matter, without any injury or blemish whatsoever, excepting a small spot at the place where the matter is applied, which is commonly on the arm. It is therefore greatly to be wished that an intimate knowledge of this wonderful discovery may be acquired by the natives of this country, so as to enable them to preserve the lives of the rich and honourable, as well as those

of low casts. On this account it might be useful to remove a prejudice in the minds of the people, arising from the term cow-pock, being literally translated *Comary*, in the advertisement which has been published in our Tamul tongue; whereas there can be no doubt that it is a drop of nectar from the exuberant udders of the cows in England, and no way similar to the humour discharged from the tongue and feet of diseased cattle in this country.

(Signed)

MOOPERAL STREENIVASACHARY."

As vaccination is now so generally adopted in Hindostan, and likely to become an universal blessing in that populous part of the globe, it may be satisfactory to mention the following singular fact, respecting the antiquity of vaccination in India, taken from the Asiatic Register for 1804; which is altogether a curious and authentic addition to a subject so interesting to humanity.

"The fact stated in the following translation of a written memorandum from the Nabob Mirza Mehady Ali Khan, who was long resident at Benares, that the effects of vaccination have been known for a great length of time in that celebrated quarter of India, is referred to the investigation of those who have the opportunity and ability, since they cannot want the inclination, to prosecute so interesting an inquiry. The undoubted intimation of this fact, that vaccination has been practised among the worshippers of Bowannee, will not detract an iota from the merits of the Jennerian discovery; the fortuitous and happy circumstance that led to the discovery in Europe, has been unquestionably and most satisfactorily proved, whilst the anxiety, study, perseverance, and indefatigable exertions, which have been applied by its benevolent professor to ensure the conviction of the world, in the unbounded benefit of the discovery, have entitled him to the lasting gratitude of mankind. The full ascertainment of the fact will only go to afford an additional instance of primeval oriental knowledge; whether acquired or accidental is to be hereafter proved. It will only open an additional, neglected mine, for the curious and the learned; and will be another proof that the East has been the seat of wisdom, "where learning flourished and the arts are

prized;" however much the neglect with which this knowledge has been treated in this country, may reflect upon the modern degeneracy, or the prejudices of the Indian character; which may, however, be all accounted for from the effects of the various revolutions to which their country has, for so many ages, been a prey; leaving thence room to the liberal construction of the unbiassed of every nation to conclude, that before the introduction of a foreign sway into Hindostan and the Deccan, its Hindoo inhabitants were versed in the arts and sciences, far beyond the other parts of the world, at the same remote period of time."

Translation of a written Memorandum from the Nabob Mirza Mehady Ali Kahn.

"During the period of my abode in the district of Benares, my eldest son being taken ill of a bad kind of the small-pox, and my friends interesting themselves for my comfort and his relief, one of them named Slookum Chund, a Hindoo, pointed out to me that there was in the city of Benares one Alep Choby, a Brahmin from Oude, whose practice was chiefly confined to this malady. Him, therefore, I lost no time in sending for to the town of Ghazeepoor, where I dwelt; and he arrived on the ninth day of the eruption; on seeing which he observed, that if the eruption had not taken place, he would have endeavoured to facilitate and render it easy, but that now it was too late. On asking Choby what the process was, he said, 'from the matter of the pustule on the cow, I keep a thread drenched, which enables me, at pleasure, to cause an easy eruption on any child; adoring at the same time Bowannee, (who is otherwise called Debee, Mata, and Sebla, and who has the direction of this malady,) as well in my own person, as by causing the father of the child to perform the like ceremonies; after which I run the drenched string into a needle, and drawing it through between the skin and flesh of the child's upper arm, leave it there, performing the same operation in both arms, which always ensures an easy eruption; on the first appearance of which the child's father or guardian renews his worship to Bowannee; and as the animal this goddess rides on is an ass, it is customary for such parent or guardian to fill his lap with grain,

which an ass is sent to eat up These observances ensure the propitious direction of Bowannee, so that only a very few pustules make their appearance, nor does any one die under this process.' Thus far did I learn from Alep Choby.

"Upon referring on this subject to a native, well versed in the learning and customs of the Hindoos, he told me that the practice thus described by Choby was not general among them, but confined to those who were attached to the worship of Bowannee, and adored her with implicit faith; and upon my asking the person whether he was aware how the matter of the pustule got from the cow, and whether all cows had such pustules, or only those of a certain description; he answered, that on these points he possessed no information, but had certainly understood that the cows had these pustules break out on them, and that from the matter thereof children were infected, acknowledging however that he spoke not this from ocular knowledge, but from report."

*Account of a new Blow-pipe, in a Letter from Mr. JOHN
NEWMAN to the Editor.*

[From the London Journal of Science and the Arts, No. I, 1816.]

SIR,

As I conceive you must feel interested by every thing connected with science, I take the liberty of sending you a short description of an instrument calculated to lessen the fatigue attending some of the researches of an experimental philosopher. The common blow-pipe is an instrument, which, though of great value to the operative chemist, has many defects. Whilst in use it confines the motions of the person working with it, and renders him incapable of giving that minute attention to his experiment which is often required, and its application is confined, since by means of it the breath only can be employed to produce the required effect.

To obviate these and other disadvantages has been the object of many persons, and by adapting apparatus to the simple instrument, they have endeavoured to make it more complete

and perfect. Some of these improvements are calculated to leave the operator unengaged with the immediate care of the instrument, and others enable him to feed the flame with such gaseous matter as will increase the combustion and exalt the temperature; but they have in general, I think, either rendered the instrument more bulky, and consequently inconvenient; or more intricate and subject to derangement. I have long thought the blow-pipe capable of much improvement, but it was an object also to preserve its simplicity; I flatter myself, that without lessening the latter, I have added something to the perfection of the instrument.

Having frequent occasion to condense the air in cavities, I had observed with some surprise the length of time required by the air so confined to escape through such small apertures as might exist, or were purposely made into these cavities; and in conversation with Mr. Brooks he suggested, that if the stream were tolerably equable, the principle which gave rise to such an effect might be followed with advantage in the construction of a blow-pipe, and I have since verified this idea.

The instrument I have made consists of a strong plate copper box perfectly air tight, three inches in width and height, and four in length, a condensing syringe to force air into the box, and a stop cock and jet at one end of it to regulate the stream thrown out. The piston-rod of the condenser works through collars of leather in the cap, which has an aperture in the side and a screw connected with a stop-cock, which may again communicate with a jar, bladder, or gazometer containing oxygen, hydrogen, or other gasses. This communication being made, and the condenser being worked, any air that is required may be thrown into the box and propelled through the jet on the flame.

The use of the instrument is very simple. By a few strokes of the piston the air is thrown into the chamber and forms a compressed atmosphere within it. When the cock is opened the air expanding issues out with great force in a small but rapid stream, which, when directed on the flame of a lamp, acts as the jet from a common blow-pipe, but with more precision and regularity. The force of the stream of air is easily adjusted by opening more or less the small stop-cock, and I have

found that with a moderate charge it will remain uniform for twenty minutes; opening the stop-cock, or the use of the syringe, will immediately raise it to its first strength.

These blow-pipes are very portable, not liable to injury, and answer, I believe, the expectations of all who have tried them, and I have made many of them for different persons. The whole instrument, with a lamp adapted to it, packs up in a small box not more than six inches in length and four inches in width and height, and there is enough space left for other small articles. I have fitted up boxes rather larger in size with a selection of tests and other useful articles in addition to the blow-pipe, and in this state they form complete mineralogical travelling cabinets.

I am, Sir,

Your obedient humble servant,

JOHN NEWMAN,

Philosophical Instrument Maker,

No. 7, Lisle-street, Leicester-square,

Specimen of a new Nomenclature for Meteorological Science,
by THOS. FORSTER, F. L. S. Hill. Soc. Nat. Sci. Phil. &c.

[From the Gentleman's Magazine, for February, 1816.]

THE habit of the English writers of borrowing from other tongues the greatest part of their technical words, especially those which are used for the sciences, is one of the causes why natural history is not so much known to the generality of the people here, as it seems to be in many of the northern countries. This fact was brought into view to me, when I asked several artists, who were about to travel over Wales and other mountainous lands, to watch for and to sketch the changes of the different forms of the clouds which took place in such places, in order to compare them with those which are common in flat countries. They told me that they could never remember the technical terms, which were made up of Latin or Greek words, which they did not understand; and wished that

names could be given to meteorological phenomena, which are formed out of our own tongue. Struck by this remark, I made the following name-list, which I shall go on with hereafter for other appearances. Meanwhile, those who will do me the favour to make remarks, or to take sketches of the clouds, &c. can make use of the following terms:

CURL-CLOUD. The old name in Latin by Mr. Howard, is *Cirrus*, a curl; *Cirrus* and curl being the diminutive.

STACKEN-CLOUD, or *Cumulus*, from the verb to stack, to heap up.

FALL-CLOUD, or *Stratus*; being the falling, or subsidence of watery particles in the evening.

SONDER-CLOUD, or *Cirrocumulus*, is a sundered cloud, made up of separated orbs. The characteristic of this cloud being the gathering together into a bed, of little clouds, yet so far asunder as not to touch.

WANE-CLOUD, or *Cirrostratus*; from the waning or subsiding state of this cloud in all its forms.

TWAIN-CLOUD, or *Cumulostratus*; made often by the twining or uniting of two clouds together.

RAIN-CLOUD, or *Nimbus*, speaks for itself. So we can have *Storm-cloud*, *Thunder-cloud*, &c.

MOON-RING, or *Halo*; a ring including an area around the Moon.

SUN-RING, the same about the Sun, *Solar Halo*.

MOON-BURR, a fleecy or confused burr about the Moon. The old name is *Corona*. So we have *Sun-burr*, *Double Moon-ring*, *Threefold Moon-ring*, *coloured Sun-ring*, &c.

MOCK-SUN, or *Parhelion*.

MOCK-MOON, or *Paraselene*.

MOON-CROWN: this may answer to the *Halo Discoides* of my Nomenclature.

RAINBOW, retains its old name instead of *Iris*.

RAIN-RAY, the *Rabdi divergens* of my Name-list.

CONE-RAY, the *Rabdis pyramidalis* of the same.

SHOOT-FLAME, or shooting, or falling star, instead of meteor. Thus we can have *White-tailed*, *Shoot-flame*, &c. instead of *Caudate Meteor*.

WISP-FLAME, or *Ignis fatuus*.

POLE-STREAMER, or Northern-light. The Aurora being Australis, as well as Borealis.

BLOOMEN-FLAME, the electric flame seen about flowers, particularly the evening primrose, described in my Res. Atm. Phæn. &c.

As I intend to publish a more complete Nomenclature for Meteorological Science in the course of a short time, I have merely made this specimen, intended to be inserted in some of the periodical journals.

For explanation of the phenomena for those who are unacquainted with them, I refer to my "Researches about Atmospheric Phenomena;" in which I have given plates explanatory of the clouds, in many of their various forms. Any information on meteorological subjects with which my friends will honour me, will be thankfully received, as I am collecting materials for future publication.

T. FORSTER.

On Contractions after Burns or Extensive Ulcerations. By
HENRY EARLE, ESQ. *Surgeon to the Foundling Hospital.*

[From the London Medico-Chirurgical Transactions, Vol. V.]

THE occurrence of contractions after large ulcerations where the subcutaneous tissue has been extensively destroyed, is so frequent a subject of regret among surgeons, and so constant a source of blame among the parents and friends of the unfortunate sufferers, that I trust no apology is necessary in offering the following observations and case.

I should have hesitated in giving publicity to an insulated fact, and should have waited until subsequent experience had confirmed the plan of treatment which I shall recommend to be adopted in these cases, but that I conceive the principle on which it is grounded to be perfectly established, though the present application of it may be in some respects new; and farther I am unwilling to withhold any suggestions which may at all interest the cause of humanity.

I have said that these contractions are a source of blame to surgeons; in some instances, perhaps, such reproaches are merited, as much may be done to prevent them by proper and strict attention to position during the progress of the healing process: and many limbs are suffered to continue in a bent position, by which the sides of the wound are proximated, and a smaller surface left for cicatrization, even when such wounds are in the immediate vicinity of a joint. By such practice the permanent benefit is often sacrificed to remove a temporary evil. The wounds are certainly sooner healed over, but the limb may for ever after remain contracted and useless. Frequently, however, such contractions do not depend on any inattention on the part of the surgeon, but are the result of a natural process which follows cicatrization, and which has often baffled all the efforts of art to control. This process consists in an absorption of the granulations on which the new skin has been formed; by which the cicatrix is made to occupy a much smaller extent than the originally ulcerated surface. Perhaps it would be speaking more correctly to say, that the granulations, which are at first florid and extremely vascular, after having deposited the new skin, receive a smaller proportion of blood, become paler and diminished in bulk, and consequently occupy much less surface for the new skin. In many cases, such as amputation, where sufficient integuments have not been saved to cover the bones, this process is very salutary, as it is essential to have the smallest possible extent of new skin on a surface which is to be subject to much pressure. But when it occurs in the neighbourhood of the neck or any of the joints, it often causes the most distressing contractions and deformities. The force with which this gradual process acts is truly astonishing. I have known it draw down the chin upon the sternum, and approximate the shoulders so much as to cause a partial absorption of the clavicles, and completely alter the dimensions of the thorax.

To superficial observers, unacquainted with the nature and extent of the mischief, it would appear that the whole evil depended on the contracted integuments, by a simple division of which the limb would be instantly set at liberty.

So deceptive is this appearance that I have more than once

known men indulge this vain hope of affording relief, until a painful and ineffectual operation has convinced them of their error. In recent cases, occurring in any of the extremities, the contraction may be confined to the integuments, by dividing which, the deformity may be for a time removed; but the same cause continuing to operate will produce the same effect, and the limb will again contract after the wound is suffered to heal up. Where the contraction has been of longer duration, the muscles acquire a new sphere of action, and afford an additional and powerful opposition to the free exercise of the limb. Lastly, where it occurs about the trunk, even the bony fabric becomes moulded and adapted to particular forms by the powerful constriction exerted on it by this gradual but certain process. In such cases it is hardly necessary to add, that the most severe operations cannot afford a prospect of even temporary alleviation.

From having several times witnessed such operations, which are wholly inefficient to the end in view, I was induced to adopt a different mode of proceeding in the case which I shall now beg to relate.

William Rule, aged six years, was brought up from the nursery in November, 1813, to be admitted into the Foundling. I was requested to examine him on account of a contraction in his left arm. On inquiry, I found, that, about a twelve-month before, he had been very severely burnt, in consequence of his clothes taking fire; his neck and back had been extensively injured, but were then perfectly healed; his left arm and fore arm had suffered most; particularly on the inner and fore part, and there were then several small ulcerations which had been repeatedly healed, and again broke out from the very tense state of the integuments. From the fore part of the upper arm, to within about two inches of the wrist, a firm tense cicatrix of an almost horny consistence, extended, which kept the elbow immoveably bent to a right angle. Being fully aware of the inefficacy of a mere transverse incision, on mature consideration of the case, I proposed to remove the whole cicatrix, and to endeavour to approximate the integuments from the two sides of the arm, which was to be kept extended on a splint, not only during the healing of the wound, but for a consider-

able time after the cicatrix had formed; until, indeed, those changes, which I have above described, had been fully accomplished. By such practice I conceived that the contraction, which I knew must follow so extensive a wound, would take place in a lateral direction, and not in the long axis of the limb. In a word, I hoped to be able to direct and modify that, which it was not in my power to prevent, and thus, at all events, counteract its injurious effect. Having submitted my opinion to some professional friends, which met their concurrence, on the 12th of November I performed the operation with the assistance of Mr. Lawrence, in the following manner. I made an incision on the outer side of the cicatrix, commencing about two inches above the elbow, where it was broadest, and terminating within two inches of the wrist; nearly the whole of this incision was made through the sound integuments. I then made a similar cut on the inner side, and carried it down gradually, converging until it met the opposite incision. The upper part of this incision was necessarily made through the cicatrix, which nearly enveloped the inner side of the elbow. The next step was to dissect off the firm horny cicatrix, which I detached from below upwards as high as the commencement of the incision, conceiving that this triangular flap of cicatrix might be useful in accelerating the healing of so extensive a wound. I did not remove it from its upper broad basis, thinking that it might unite in its new situation. On attempting now to extend the arm, we found considerable resistance from the forcible contraction of the flexor muscles, which had been so long accustomed to a more limited sphere of action, that they with difficulty admitted of any extension. By degrees, however, they yielded considerably, and the arm was brought nearly to a right line. When the arm was so extended, the extreme point of the cicatrix, which still remained attached to the upper arm, was deficient nearly three inches of reaching the part from whence it had been removed.

The sides of the wound were now approximated as much as possible with adhesive plaister, and the whole limb was bound down on a splint. As the operation had been rather tedious and very painful, and there was great disposition to spasm in the biceps, I gave him a large dose of opium, and

directed the nurse to sit by him and hold his hand, which checked the violence of the cramps. This disposition in the muscles to contract gradually abated, and the following day I was able to extend the arm perfectly to a right line. On removing the dressings, four days after, I found that the whole of the cicatrix which I had detached, had sloughed; in consequence, I suppose, of its being a part of new formation, and not possessing the same vital powers with an originally formed part. The slough was soon thrown off, and the wound, though extensive, wore a healthy aspect.

Nothing sinister occurred during the progress of the cure, and the whole was perfectly healed by the 20th of December. I continued to apply the splint constantly for about six weeks longer, during which time the cicatrix diminished much in a lateral direction, and in a very slight degree in the long direction, but the arm continued perfectly straight. I now permitted him to use his arm for some hours during the day, but re-applied the splint when in school and at night. By degrees he left off the use of the splint altogether during the day, but I directed it to be applied at bed-time until about a week since. I am happy to add, that nearly five months have now elapsed since the wound was healed, and his arm continues perfectly straight, and he enjoys the free use of it as much as the other. The cicatrix has contracted laterally to about one-third the size of the wound, is quite insensible, hard and devoid of vessels, and on the whole, from its present appearance, I do not apprehend that any further alteration will take place.

I have considered this case ~~not~~ unworthy of attention, as it strongly illustrates the efficacy of art, well directed, in counter-acting and even rendering subservient a powerful law in the animal economy. The view which I have been led to take of the subject is, I believe, new, and the result of the case will, perhaps, warrant my expectations that it may be beneficial both in the prevention and cure of many deformities and contractions in the extremities.

Should a similar case occur to me again, I should prefer the removal of the whole cicatrix at once, to leaving it with the probability of its sloughing.

Report on the Epidemic Small Pox and Chicken Pox, which prevailed in New-York during the last Autumn and Winter, explanatory of the Causes of supposed Failures of the Vaccine Disease. Ordered by the Medical Society of the City and County of New-York, at their quarterly meeting, January, 1816.

[The re-appearance of Small Pox in the City of New-York during the last year, has excited the attention of the Medical Society; the report of whose committee may be considered as a valuable document on this interesting subject. They have designated the origin of the disease, its character and mortality, and have expressed their opinion on the efficiency of Vaccination, and of the sentiments entertained with respect to its preservative power. They also give an account of the appearance of Varicella, with the unusual severity of its symptoms.

We make an abridgment of this publication, which is well worthy of public notice, and hope it may excite similar attention in other parts of our country, where epidemics shall appear in uncommon forms.]

To the Medical Society of the City and County of New-York.

The Committee appointed to examine into the progress of the Small Pox for the year past in this city: to ascertain the origin of reports which have arisen unfriendly to the Vaccine Inoculation, and to enquire into any supposed failure of the Kine Pock;

RESPECTFULLY REPORT:

That they have diligently endeavoured to ascertain the origin of the small pox. The first fatal case of that disease was found reported at the Inspector's Office on the 15th May, 1815. It occurred in the person of a soldier of the name of Asa Tanner, who had been for a long time in a Military Hospital on account of frosted feet, from which he had not recovered when he arrived in this city, in a coasting vessel from Boston. He lodged in a common boarding house in the lower end of Front-street, and was taken sick immediately after his arrival: it was a case of confluent small pox, which terminated his life in five days. No person was discovered to have taken the Small Pox from this man excepting another soldier and fellow-lodger in the same house, who, it is believed, died in the Military Hospital at New Utrecht, on Long-Island.

No other fatal case of this disease is found recorded until

the 28th of August. Another death occurred on the 30th of the same month, more than three months after the first recorded death by the small pox.

Your committee are informed by A. Smith, a soldier, that the small pox existed on Governor's Island in February, 1815. He particularly mentioned a girl of the name of Munson, the daughter of a soldier, who had the small pox about that time. She was attended in the hospital by the military surgeon, and recovered.

In the early part of October, the small pox appeared in various parts of the city, and further inquiry into succeeding cases of it was deemed unnecessary.

Your committee not having been able to procure any public or private records of the cases of small pox, except of those which were fatal, regret that it has not been in their power to trace more explicitly the introduction of that disease into our city.

Your committee, however, are inclined to think, that it was introduced from some distant place by means of trading or coasting vessels: this opinion is derived from the consideration of the two first recorded deaths, and of the second case of the disease; or, that it has been conveyed into the city through the military, with which our intercourse has been more extended and multiplied during the continuance of the late war, than any other district of the union. The early appearance of the small pox in the military hospital of Governor's Island, and the fatal termination of the complaint in three soldiers at the commencement of the epidemic, have already been mentioned.

In the course of the month of November, the United States' frigate *Guerriere* arrived in this port from the Mediterranean, with many of the crew labouring under the small pox; seventeen cases of that disease were carried to the hospital at the Wallabout.

Your committee have to offer a few remarks in relation to the character and mortality of the small pox, as it has appeared in our city. As an epidemic, generally speaking, it has been so virulent in its nature, as to attack almost every individual in whom the susceptibility to its action had not been destroyed

by inoculation or vaccination. The duration of the disease was generally short, the progress of it very rapid, and the treatment, comparatively speaking, but rarely successful. In the the majority of instances it was confluent: adults appear to have been as subject to it as children. It prevailed most among the poorer classes of the community, and more in the eastern and upper parts of the city, than near the North River, and in the larger streets on the west side of Broadway. The proportion of deaths, from this confluent small pox, has been greater, in the opinion of your committee, than has ever been observed in London, or on the continent of Europe. The number of deaths, recorded in the Inspector's Office, amounts to two hundred and fifty-four; and thirty-nine deaths are reported to have occurred at the Lazaretto. This number, in the opinion of your committee, is somewhat more than one third of the aggregate cases of the confluent small pox that have occurred in the city. But supposing the aggregate of such cases of the small pox to be only eight hundred; and admitting an addition of one third of this number to have taken the small pox in a mild way, or of the distinct kind, it will give a total of nearly eleven hundred cases of the small pox that have occurred in this city and its suburbs, from the period of the first reported death, to the 1st of April, instant; exclusive of a very large proportion of persons that have received the disease by inoculation, and of whom no precise or definite estimate can be made, for the want of the necessary records.

The varicella, or chicken pox, another eruptive and febrile disease, appeared about the same time with the small pox, and prevailed generally throughout the city and its suburbs. It was marked by severe and unusual symptoms, and presented the appearances in particular cases, that have been said to belong to swine pox, or water pox, authorising the conclusion of their being varieties of the same disease.*

It has been observed, that "medical assistance being seldom necessary in the chicken pox, practitioners are less acquainted with this than most other eruptive fevers."† The committee here advert to the opinion of such high authority on this sub-

* Thomas's Modern Practice.

† Wilson on Febrile Diseases.

ject, for the purpose of explaining the instances of chicken pox, that have been mistaken for the small pox; and also to account for the differences in the histories of this disease, as furnished by European writers; and who have not described it agreeably to the appearances and severity it has exhibited during the late epidemic. The committee agree with the European writers in the opinion, that no danger ever attends the chicken pox; that its pustules form much sooner; are irregular in their shape, more transparent, and seldom contain well-formed pus. They agree also, that by the fifth day they are generally drying or disappearing; and that from this period all the symptoms continue to decline, leaving no marks on the skin, excepting in a few instances, or from accident.

Authors have generally remarked, that this disease arises from a specific poison; but it should also have been added, that this poison must necessarily be ephemeral and extremely mild in comparison with small pox, since it is admitted that danger never attends the former; that its largest pustules disappear without the least injury to the system; while the epidemic small pox is generally followed by a secondary fever as a part of a much more protracted disease, the violence of which is in proportion, it is supposed, to the quantity of matter absorbed, and oftentimes places the life of the patient in the most imminent danger.—It may also be noticed, that the vesicles of the chicken pox present large and irregular, or only partial scabs, situated on their apices, and do not leave the discoloration of the skin, which frequently continues a very long time after the small pox; that, at the period of desquamation, there are very perceptible prominences in the skin, very easy to distinguish from the even or indented surface left by the small pox; the pustules of which are converted into scabs, or their contents are discharged on the skin.

Authors have stated, that varicella is preceded by a short slight fever, or by a fever of uncertain duration, and that it is not attended by severe symptoms. Your committee, however, have seen it assuming a degree of violence equal to some of the forms of small pox, producing convulsions and great general derangement of the system. They have remarked also what they find to have been noticed by Pinel, Willan, and

others, that the chicken pox may be confluent to a great degree; and they believe that it may be protracted to a longer period even than small pox, owing to the partial eruption of pustules, and the successive formation of others for many weeks; that the eruption may be more abundant on the face and head, than on the back and breast, and that it may even occasion a swelling of the face.

It has been further represented, that the chicken pox depends upon a specific contagion; that it affects a person but once in his life, has a great resemblance to the small pox, and is communicable by inoculation with the lymph of the vesicles.*

Whether the aggravated form of chicken pox that has been observed during the last autumn and winter was owing to any peculiar atmospheric constitution, or other cause, and whether it is to be considered a special variety of chicken pox, to be added to the form most commonly described, your committee will not venture to decide. They can however affirm from observation and conviction, that numerous instances of the prevailing form of this complaint, being slightly noticed, and occasionally mistaken, have contributed greatly to multiply reports of the failure of vaccination. They have been repeatedly called to witness *such instances* of the failure of vaccination, and of pretended or imaginary cases of the small pox, which would be erased much sooner from the skin, than erroneous impressions could be removed from the minds of the uninformed and inexperienced.

From the foregoing statement of the origin and progress of the late epidemic, and of the causes of reports unfriendly to the vaccine disease, your committee may be allowed to suggest, that more effectual means should be devised to guard against any future occurrence of the small pox; to promote a more general adoption of the practice of kine pock inoculation among the poorer classes of the community, and to introduce such improvements as are best calculated to obviate the evils that may arise from the failure of vaccination hereafter.

* Bateman on cutaneous diseases.

Note. The eruption of varicella is sometimes preceded by a general rash on the skin, similar to what is observed in small pox.

On all these important topics, the committee have to offer what they believe to be conclusive and practical remarks: they would premise, however, some observations respecting the “improved mode” of vaccinating lately proposed by the London Vaccine Institution. It appears that ‘the board’* attributes many failures to vaccinating by a single puncture, and afterwards opening the vesicle, and taking a portion of the lymph for the purpose of propagating the infection. Should the doctrine thus officially promulgated by that institution be true, your committee must necessarily infer, and deeply lament, that vast numbers of persons in this and in other countries, remain only delusively protected by vaccination, since the practice thus reprobated has been very generally approved, and has as generally prevailed throughout Europe and America.

The “board of the London Vaccine Institution” have not been at the pains to state the period of the disease at which the puncture or rupture of the vesicle may interfere with its operation on the system; but inasmuch as the effect of the disease generally takes place on the seventh or eighth day, it may be inferred, that the board apprehended that danger may arise from puncturing the vesicle at any time during the existence of lymph in it. With all deference and respect to such high authority, your committee owe it to themselves, to the Medical Society of which they are members, to the laws of the animal economy, to the laws of contagion in general, which they consult, and to the tranquillity of the public mind, which they wish to establish,—explicitly to declare their dissent from the doctrine promulgated by that board, and which is founded upon the principle, that by diminishing the quantity of the vaccine virus, or lymph, after it is formed in the part, the operation of the disease on the system is in danger of being destroyed or enfeebled, notwithstanding the lymph is secreted in the part, and possesses all the characteristics of the vaccine virus. Admitting, for the sake of argument, that it is experimentally proved that a small pox pustule, and a kine pock vesicle, can be locally excited, and can respectively furnish genuine virus, in persons who have already had those

* Medical Repository, No. 2, vol. III. N. S. p. 201.

diseases; yet it is believed to be utterly unknown, that a true and genuine pustule of small pox, or vesicle of kine pock, can take place without infecting the system, if susceptible of either of those diseases at the time. No contagious disease, after being communicated by the inoculation of its specific virus, is known to have been arrested: this can only be done by the immediate destruction or removal of the poison, or of the part to which it has been applied, before absorption has taken place. Absorption of the inserted virus is absolutely requisite to excite its specific disease, in a person in whom the susceptibility to it exists, or has not been destroyed; and it must have had a complete evolution in the system, or have exercised its peculiar property in producing an appropriate disease, when the pustule exhibits, among other characteristics, the presence of lymph, or matter capable of reproducing the same.

If the bursting or puncturing of the vaccine vesicle could endanger or subvert the efficient operation of the disease on the system, the genuine character of the vesicle should be completely destroyed, which has not been observed in any of the numerous instances that have occurred; for, whatever injury the vesicle may have sustained, the peculiar scab, more or less expressive of the disease, is reproduced, and its peculiar mark, more or less enlarged, is left on the skin. Your committee are not acquainted with any thing that can possibly interrupt or prevent the constitutional operation of the kine pock in a susceptible subject, excepting a morbid state or action of the system, which may preclude every character of the disease, or a constitutional excitement inimical to cow pock, and giving rise to many of those irregularities "observed in the progress of the affection at the part inoculated."*

It is well known that Mr. Bryce, of Edinburgh, several years ago recommended a process as demonstrating the constitutional operation of the vaccine disease, and which consisted in performing a second vaccination about the end of the fifth, or beginning of the sixth day after the first. If a constitutional affection be produced by the first, the progress of the second vaccination is so much accelerated, that by the eighth or tenth day from the period of the first vaccination, both

* Bryce on Cow Pox.

vesicles are equally far advanced, the second vesicle being a miniature likeness of the first. Against the truth of this fact, or the conclusion which it furnishes, no possible objection can be made; it implies that additional vesicles, so far from imparting more power or energy to the virus previously inserted, are altogether under the control of the first. It is of little importance how many vesicles there may be, or at whatever time they may be excited, since one alone fully imparts the constitutional action of the disease. Experience also offers another fact to prove the inutility of additional vesicles to secure or complete the action of the disease on the system. If additional vesicles impart strength or preventive power to the process, how is it that spontaneous vesicles do not occur in the most active cases of that disease? There are various degrees of activity in diseases arising from specific contagions. Thus the vaccine sometimes excites high fever; produces an uncommonly large vesicle, attended with an unusual degree of inflammation, and secondary suppuration; but it hardly ever creates an additional vesicle; at least so very rarely, that the oldest vaccinators have not perhaps witnessed it more than once or twice. Your committee conclude, that the mode recommended by the London Vaccine Establishment, of exciting two vesicles instead of one, is never absolutely necessary; and that the utility of it can only be urged as an additional security to the introduction of the virus, by multiplying the chances of success.

A very extensive and dangerous source of error arises out of the idea of a certain *spurious* vaccine disease, and a certain *spurious* vaccine matter. It may be traced to the written and oral opinions of the earliest vaccinators, who did not discriminate between an imperfect and defective operation of the system, and a supposed specific matter, which has since been thought capable of producing a specific spurious disease. Great stress has been laid on this subject, without offering the least direct or convincing proof of the reality or existence of such an article as a spurious cow pock matter. From whence does it proceed, and where shall we search for it? Does it originate in the cow, and is it thence perpetuated by inoculating the human body, or is it spontaneously generated in man? Is it

durable, ephemeral, or variable? By what regular characters can it be detected, judged of, and described? And why, if it be a specific contagion, does it occasionally arise from the use of genuine cow pock matter? It appears somewhat remarkable, that many of these points have hitherto been only carelessly adverted to, by persons who have endeavoured to engage the sanction of the public in instituting a vaccine establishment, sounding the alarm and danger of a spurious matter, and ascribing the want of success in vaccinating to the use of it.

Having alluded to the deficiency of proof respecting the existence of a specific spurious vaccine virus, your committee would not be at a loss to substitute opinions and inferences on this subject, apparently more consistent with facts and practical observation, to account for the irregularities or deviations, which have been construed into marks of a spurious disease. They however do not think it proper, at present, to enter into the consideration of that subject, but leave it for a future and more particular investigation.

Professional men should feel it indispensably necessary to conduct the process of vaccination with the greatest possible attention, through all its stages, and until its complete operation on the system has taken place; and they should ever be ready to repeat the process, if any irregularity or deficiency in the first shall have been noticed.

It may be suggested, for the proper discharge of this important duty, left entirely to the responsibility of the physician, that a regular period of attendance should be observed throughout the whole course of the disease; that attention should be especially given on the fifth, seventh, ninth, and twelfth days, or at least three times during the first ten or twelve days of the disease; and lastly, that the unerring test, proposed by Mr. Bryce, should be resorted to whenever it is practicable. The importance of attending to persons who have been vaccinated, is the more sensibly felt by your committee, because in the many instances of suspected or reported failure of vaccination, they have scarcely been enabled to collect any satisfactory medical testimony in relation to the nature and progress of the previous disease.

Your committee have been at great pains to examine into the

history of some of the cases in which small pox is said to have succeeded to the kine pock. They are compelled to state, that in several instances, no other evidence of vaccination could be obtained than the oral and insufficient testimony of the patient or his friends, and that not even the least mark of a kine pock vesicle could be discovered. That in other instances, when a mark in the skin was triumphantly proclaimed as an evidence of previous vaccination, the person's arm had been treated by salves, poultices, and other applications, ordinarily resorted to for the healing of common sores; that in others, the arm had become excessively inflamed, the swelling had extended from the elbow to the shoulder, and the sore had continued to discharge profusely for many weeks; and finally, that in other instances, their attention has been directed to marks on different parts of the body, the consequence of sores, which were supposed to furnish the strongest evidence of the constitutional effect of the vaccine disease; an opinion that is fraught with danger, and is in opposition to the writings of Jenner, and the best authors on this subject, all of whom affirm, that no cutaneous eruption whatever, belongs to the kine pock disease.

Neither is the kine pock a preventive of small pox for a limited time only, nor does it produce new and dangerous diseases, as has been affirmed by its opponents. Already has it proved a security against the small pox for the space of near sixty years; persons having accidentally taken the disease from milking cows in Gloucestershire, in England; where it has been believed, time immemorial, to protect them against the small pox.

On the subject of cutaneous diseases, no authority ever stood higher than that of Dr. Willan, who has said, after the most careful examination, that no new disorders have appeared since the discovery of the kine pock; that he has investigated many cases that were attributed to the kine pock, but found diseases well known and described a thousand years ago; common diseases of the skin, having no connexion whatever with the kine pock. The number of diseases of the skin, instead of increasing, have diminished since the introduction of this preventive; in proof of which, facts were adduced by Dr. Willan and others, who also assert, that the kine pock has a decided

advantage over the small pox, measles, and scarlet fever, in not exciting any other disease.* In a report of the Royal College of Surgeons of Edinburgh, in 1807, it is said, "The members of the Royal College have met with no occurrence, in their practice, of cow pox inoculation, which could operate in their minds to its disadvantage; and they beg leave particularly to notice, that they have seen no instance of obstinate eruptions, or of new and dangerous diseases, which they could attribute to the introduction; among mankind, of this mild preventive of the small pox." And in a report of the College of Physicians of London it will be found, that "the testimonies before the College of Physicians are very decided in declaring that vaccination does less mischief to the constitution, and less frequently gives rise to other diseases than the small pox, either natural or inoculated."

To encourage the practice of vaccination among the poor classes of the community, is an indispensable precaution to avert the dreadful effects of future epidemics of the small pox. Your committee have already adverted to the prompt and humane measures taken by the common council, board of health, and city dispensary, in December last, for this purpose; but they would earnestly recommend still more efficient regulations than those which are instituted by Philanthropy, and in consequence of the immediate pressure of a public calamity.

Your committee are informed, that most of the continental nations of Europe have successfully contended against the small pox, by providing for the vaccination of the poor, and at the same time making it a penal offence to inoculate for the small pox. It is a lamentable fact, evinced by experience, that nothing short of compulsory measures is sufficient to oppose the effects of ignorance and prejudice.—To guard against the introduction of the small pox into this populous and commercial city, is an object of great moment, and well worthy attention in revising the health laws. Would it not be advisable to reconsider the propriety of excepting the disease of small pox from among those which are the objects of

* Willan on Vaccination.

quarantine laws? Ought not every vessel infected with the small pox to be interdicted from approaching this large population? And ought not every case of the small pox, occurring in our city, to be immediately reported to the board of health, to apprise the citizens of the danger of approaching it?

Previous to the discovery of the kine pock, it was computed that forty thousand persons died annually from the small pox in Great Britain and Ireland; that in twenty-five years, Europe had lost fifteen millions of inhabitants by that disease, and that in America the natural small pox had proved proportionably still more destructive. Every inoculation therefore, for the small pox, tends to destroy life, and to perpetuate that loathsome disease; whilst every vaccination tends to preserve life, and to extinguish the small pox.

In concluding this report, your committee must advert to the general testimony of the oldest and most skilful professional vaccinators, whose opinions and writings they have been able to consult, and whose discerning minds have not laboured under the acrimony of controversy, or been influenced by prejudice or misapprehension. Their testimony is found to be uniform and unequivocal in favour of the efficiency of the vaccine disease. It must, however, be stated with regret, that there are a few physicians who seem still to entertain some doubts on the subject, and who, by cherishing the popular distrust of it, have, in the opinion of your committee, hazarded their reputation and the public good; but who invariably proclaim, that the small pox is rendered extremely mild in every instance after vaccination.* If a few facts of this kind, and leading to the same conclusion, were admitted for the sake of argument, they would necessarily lose their weight, when artificially or otherwise produced during the prevalence of pustular and anomalous eruptive diseases; some of which are often observed to resemble not only the small pox, but even the itch, the measles, and scarlet fever. An analogous fact has lately occurred in this city, in the appearance of a phlegmonous disease of the glands of the throat, that was frequently mistaken for the mumps.

* A second attack of small pox, which is admitted to have happened frequently, has either proved very violent, or terminated fatally.

Some idea of the perfect efficiency of the kine pock may, in the opinion of your committee, be conveyed to the public mind, by the relation of a fact that has been recently observed. In a former part of this report, it was noticed that the small pox had appeared on board of the United States frigate Guerriere: an enquiry was instituted by the surgeon to ascertain whether any of those infected with that disease, had ever had the kine pock; not one of them had had it! It was found however that there were one hundred and seventy-one who had been vaccinated in various parts of the United States and in Europe, not a single one of whom took the small pox, though constantly exposed to it in a crowded ship.

The society for the propagation of vaccination in France, reported, that nearly four hundred thousand persons were vaccinated in the year 1801, in the French dominions. Many of them were inoculated for the small pox, and others were exposed to it during the prevalence of a severe epidemic small pox, yet all of them resisted its influence; and since that period it is stated in a report to the Imperial Institute of France, that only seven persons took the small pox, out of two millions six hundred and seventy-one thousand six hundred and sixty-two persons that were vaccinated; clearly demonstrating the advantage of the kine pock in increasing population, and the welfare of mankind. By a report from Sir Alexander Chrichton, *superintendent* of vaccination throughout the Russian Empire, it appears, that during the years 1811, 12, 13, nine hundred and sixty-two thousand four hundred and three persons were vaccinated in Russia. In Spain the knowledge of vaccination was received with avidity, and was taken under the protection of the government at an early period. It would be superfluous to adduce other evidence of the kine pock as a preventive of the small pox.

Your committee beg leave to call the attention of the society to one other circumstance only: had the same number of susceptible individuals existed in this populous metropolis, as would perhaps have existed in it, had not the kine pock been discovered, we should, during the last six months, in all human probability, have had to mourn over an immense destruc-

tion of its inhabitants; the fate, alas! that has already been often deplored in many countries, and in many populous cities.

(Signed)

WRIGHT POST, M. D.

WILLIAM HAMERSLEY, M. D.

JOHN NEILSON, M. D.

FELIX PASCALIS, M. D.

JOHN WATTS, JUN. M. D.

An Account of some Diseases of the Toes and Fingers, with Observations on their Treatment. By JAMES WARDROP, Esq. F. R. S. Edinb.

[From the London Medico-Chirurgical Transactions, Vol. V.]

I. *Inflammation of the soft parts surrounding the nail of the toes.*

THERE are many diseases on which medical men seem to have bestowed little consideration, from the unimportance of the parts affected, as far as regards the life of the patient, but which nevertheless sufficiently disturb the comforts and enjoyments of those who are afflicted with them, to merit investigation.

There are no diseases to which this remark may be more justly applied than to some of those of the toes; and the subsequent observations have been made in order to give an account of some of those which have not hitherto been mentioned, and of recommending a treatment in others which may be found more successful than the means which have usually been employed.

The first of these diseases which shall now be considered, is where inflammation and suppuration take place in the soft parts contiguous to the nail, generally denominated, "the growth of the nail into the flesh."

This affection is chiefly confined to the great toe. It frequently happens, when the foot is kept in a tight shoe, that the soft parts situated on the edge of the nail thicken, are pressed over it, and become more or less inflamed and painful. If the inflammation and thickening of the soft parts increase, the

edge of the nail becomes, at last, completely imbedded in them, and its sharp edge, from the pressure of the body when resting on the foot, increases the inflammation and produces suppuration of the contiguous soft parts. Thus the hard and sharp nail, by pressing on the surface which has become ulcerated, causes great pain and lameness, and in many cases prevents the person from walking. The ulceration generally extends round a considerable part of the nail, and a fungus arises from this surface, accompanied by excessive irritability.

All those authors who have taken notice of this affection have considered a peculiarity in the growth or in the formation of the nail as the cause of the disease in the soft parts. The different modes of treatment therefore which have been proposed are directed to remedy this supposed deformity of the nail.

Some direct, that the edge of the nail which presses in upon the tender soft parts should be raised by placing underneath it a piece of tin-plate, and thinning the middle part of the nail by scraping it with a piece of glass; thus allowing the nail and its edge to take a turn upwards from the soft parts, and assume a new form. Others advise the edge of the nail to be cut away, so that it shall be out of the reach of the soft parts.

An accurate examination, and above all, observing attentively the progress of the disease, from its commencement, will be sufficient to prove that the nail undergoes no alteration in its shape, and that it has no further share in the production of this troublesome complaint than affording a mechanical resistance to the tender flesh, and becoming from its proximity to it a constant source of irritation.

I was led chiefly to make this remark, from observing on the great toe of a gentleman, whose nail was perfectly well formed, a considerable tumefaction and tenderness of the soft parts on the edge of the nail; to relieve which he was in the habit of cutting the nail very short, and removing that portion of the edge which had penetrated into the soft parts. From this operation, a temporary relief had always been obtained; but when the nail began to grow again, all the former uneasiness and inconvenience returned. It being probable, that in this case, the tenderness and swelling of the soft parts arose from, and were kept up by the pressure which those parts constantly made on

the fresh-cut edge of the nail, it occurred to me, that if the nail was allowed to grow of its natural size and shape, and some means taken to reduce the swelling of the soft parts, the disease might be removed. Accordingly the nail was allowed to grow, and the swollen parts were slightly touched with lunar caustic. The beneficial effects of this treatment were soon manifest. The caustic had the effect of producing an absorption of the thickened soft parts, the nail soon recovered its natural smooth edge, and the patient has never since had any uneasiness, except when from inattention he has accidentally cut the nail too short.

Soon after I had seen this case, an example of the disease in a much more advanced stage came under my observation. The soft parts on the edge of one side of the toe-nail, which was of its natural shape, were greatly swollen—suppuration had taken place where the nail was imbedded in them, and a painful fungus had arisen; so that the person was unable to rest the weight of the body on the affected foot.

After one application of the caustic the irritable state of the ulcer was removed; and in two days the fungus and swelling of the soft parts were greatly diminished; and by a second application these completely subsided. The nail was left untouched—and in a few days the patient was enabled to walk about, and he continued afterwards perfectly well.

In a third case the good effects of this mode of treatment were strikingly illustrated. A gentleman had for several years suffered great distress from inflammation and swelling of the soft parts, at the edge of the nail of the great-toe, and had during that time on many occasions for several weeks been unable to walk. He had frequently cut away all that portion of the nail which was imbedded in the diseased soft parts, and which appeared to him to be the cause of his complaint; and though from this treatment he experienced temporary relief, yet as soon as the nail began to grow again, all the former symptoms recurred. A few days after the nail had been in this manner cut away, he applied to me, and I rubbed the tender and swollen parts over with lunar caustic; this was followed by an immediate abatement of the pain and swelling; and by afterwards allowing the nail to grow, he has never since experienced the least uneasiness.

Perhaps the most remarkable instance of the beneficial effects of this mode of treatment, was that of a woman, who for ten years had been extremely lame in both feet, and who during that period had submitted to several painful operations of cutting out portions of the nail, without any permanent relief. The nails in this case were very thick and circular, so that they were deeply imbedded in the soft parts. The swelling of these, however, was completely subdued by frequent applications of the caustic; and in addition to this treatment I removed a portion in the form of a V from the middle of the nail, a practice common amongst soldiers, and which might perhaps in some degree serve to allow the external angles of the nail to yield and be raised from the swollen soft parts.

Besides these cases, I have had several opportunities of trying this practice, and it has been invariably followed by equal success.

From what has been said, it will be observed, that the chief point to be attended to in the treatment of this disease is, not to cut away any of the nail, but to reduce the swelling of the soft parts. I have generally found that one or more applications of the lunar caustic have had the effect of entirely removing the swelling of those parts. The caustic destroys the painful and irritable ulcerated surface, whilst at the same time it promotes absorption of the thickened parts. In some cases it has been thought necessary first to alleviate the accompanying inflammatory symptoms by the application of poultices, and in some instances also, the alumen ustum has been found to answer better than the caustic; but in all the cases, these means succeeded in curing the disease.

It may here be remarked, that in order to prevent either the recurrence or the formation of a disease of this kind, care should be taken not to cut off the corner of the nails, particularly that of the great-toe; for when this is done, the shoe presses the adjacent soft parts against the sharp edge of the nail, and thus produces pain and inflammation.

II. Of Ulceration at the Root of the Nails.

This disease appears to be a peculiar inflammation of the soft parts at the root of the nail, and probably those connected with the formation of that organ. It may properly be consider-

ed as a species of *Onychia* or *Panaris*, and I have therefore denominated it the *Onychia Maligna*, from its very malignant character.

The commencement of this disease is marked by a degree of swelling of a deep red colour of the soft parts at the root of the nail. An oozing of a thin ichor afterwards takes place at the cleft formed between the root of the nail and soft parts, and at last the soft parts begin to ulcerate. The ulcer appears on the circular edge of the soft parts at the root of the nail, it is accompanied with a good deal of swelling, and the skin, particularly that adjacent to the ulcer, has a deep purple colour.

The appearance of the ulcer is very unhealthy, the edges being thin and acute, and its surface covered with a dull yellow or brown-coloured lymph, and attended with an ichorous and very fetid discharge. The growth of the nail is interrupted, it loses its natural colour, and at some places appears to have but little connection with the soft parts.

In this state I have seen the disease continue for several years, so that the toe or finger became a deformed bulbous mass. The pain is sometimes very acute, but the disease is more commonly indolent, and accompanied with little uneasiness. This disease affects both the toes and the fingers. I have only observed it on the great-toe, and more frequently on the thumb than any of the fingers. It occurs, too, chiefly in young people, but I have also seen adults affected with it.

The treatment of this disease has generally been considered as difficult and uncertain. In many cases all local applications have been so inefficacious that the amputation of the member has been had recourse to.

The only local treatment which I have ever seen relieve this complaint, has been the evulsion of the nail, and afterwards the occasional application of escharotics to the ulcerated surface. But even this painful operation, in some cases does not succeed, and will seldom be submitted to by the patient; he must therefore either continue lame, or submit to the removal of the member. Other surgeons have cut out the soft parts at the root of the nail, an operation equally severe.

A successful mode of treating this disease, by avoiding any of those painful resources, becomes therefore an object of im-

portance, and as I have had an opportunity of observing very beneficial effects from the internal exhibition of mercury in several cases, it may be proper here to mention them.

In two of these cases the great toe was affected, in other two the disease appeared in the fingers. In all of them it had continued a considerable time, and in one of those where the finger was affected, there was often a profuse hemorrhage from the ulcer. Mercury was given in small doses at first, and gradually increased, so as in twelve or fourteen days sensibly to affect the gums.

The sores in general soon assumed a healing appearance after the system was in this state, and the bulbous swelling of the joint gradually subsided. The ulcers were dressed with wax-ointment, so that the effects of the mercury might be watched, and after the sore began to heal, a weak solution of the muriate of mercury and escharotics were occasionally used to clean the wound or keep down any fungus. The mercury was continued till the ulcers were perfectly healed, and, as is generally advisable under such circumstances, it was taken in smaller quantities for some time after the patients were apparently cured.

How far this treatment may be found successful in all cases of this disease, can only be determined after considerable experience. I am persuaded, however, that there are cases wherein it will be found an efficacious remedy.

§ III. *Of Corns.*

The great relief which *corn-cutters* give by simply removing the thickened and hardened cuticle, must have prevented medical men from making any inquiries into the nature or particular treatment of this disease; and whilst it escaped the notice of the latter, it could not have been a desideratum of the former, that any mode of treatment should be found out which might make their operations less useful, or more seldom necessary.

If a corn be examined, it will be found to consist of an increase in the thickness of the cuticle of the affected part; which, by acquiring firmness and hardness, presses on the tender skin underneath, thus exciting pain and inflammation.

The portion of diseased cuticle is thickest at the central part of the corn, and forms a conical point, which makes a corresponding concavity in the corn underneath. The inflammation sometimes terminates in suppuration, and the distress which is thus occasionally produced, exceeds what might be supposed to arise from a disease which is at its commencement so trifling.

When all the hard parts are removed, and some slight defence giving to the newly exposed and tender parts by the application of adhesive plaster, great relief is obtained; but it is only temporary. A new growth of hard cuticle quickly succeeds, which renders it soon necessary to recur to the same means; and these must be employed more or less frequently during the remainder of life.

From the great analogy of corns to the common *wart*, a disease so successfully removed by the application of escharotics, it seemed by no means improbable that a similar practice might be efficacious in the cure of corns. Accordingly I embraced the first opportunity of putting it to the test of experience.

After removing the external layers of a corn, I rubbed the surface, previously moistened, with lunar caustic. In a few days the contiguous parts lost all their tenderness, of which there had been a considerable degree, and the hardness was diminished. By a second application of the caustic the hardness disappeared, and a corn, which before required to be cut every few weeks, was, by two or three subsequent applications, kept from growing and exciting any uneasiness for several years.

Soon after this case occurred, the efficacy of the practice was strikingly exemplified by the application of the muriate of mercury to a corn. A patient who had several warts on the prepuce, to remove which he had tried various applications, at last came under my care; and I used, with success, the application of a saturated solution of the muriate of mercury in spirit of wine. Being at the same time much troubled with corns, and struck with the similarity of the two diseases, he thought he might try if the solution, which was so useful in removing the warts, would be as effectual in curing the corns.

He made the experiment, and met with the success he had anticipated.

From the frequency of the disease I have had many opportunities of recommending this practice, and I believe it has been universally followed with results equally successful. It is a remedy which, under no circumstances, can do harm, and those who have this troublesome complaint can easily receive such instructions as on all occasions to apply it themselves. I have generally directed them to cut off, with a sharp knife, or to tear out as much of the corn as they could do with safety: to keep the toe immersed for some time in warm water; and after drying all the skin contiguous to the disease, to rub over carefully all the surface of the corn with the caustic, or wet it with the solution of muriate of mercury, by means of a camel's hair pencil. Either of these applications, two or three times repeated after each of the eschars have separated, will in most instances be found sufficient to remove the corn; and when at any future period it has a tendency to grow again, the application of the caustic may be safely renewed.

§ IV. *Of the Treatment of Chilblain.*

There are many people in this country who suffer a great deal from chilblain, though it seldom occurs in the aggravated form which it so often assumes in more northern climates. It generally appears as an inflammation of a portion of the skin of some part of the extremities, and most frequently affects the heel and toes or outer edge of the foot. The redness is of a leaden hue, accompanied with swelling and an intolerable itchiness.

Though I am aware that stimulants are usually employed and are found useful in the treatment of this stage of *Pernio*, yet, as I have had opportunities of observing such remarkable benefit from the application of diluted tincture of cantharides, it may be worth while to mention in this place the effects and the mode of using this medicine.

One part of the common tincture of cantharides to six parts of the soap-liniment, is the form which I have found to answer; and it has seldom been found necessary to vary the

proportion of the medicine. The affected part of the skin is to be well rubbed once or twice a day with this embrocation, and afterwards kept warm. One or two applications usually remove all the itchiness, and after a few days the swelling and redness completely subside. As I have used this application in such a number of cases, and as it has been found equally successful in the practice of others, I have no hesitation in recommending it as a most useful and valuable remedy.

In the *second* stage of the disease, when vesications have formed on the skin, and ulceration has taken place, the cantharides will be found a beneficial application to the inflamed skin contiguous to the ulceration: it has a powerful effect in diminishing the swelling and thickening of the parts, which so often remain after frequent attacks of this disease. There is no application so useful to the ulcer itself as the common ointment composed of the red oxide of mercury:

Further Observations on the Cataract, by BENJAMIN TRAVERS, Esq.; Demonstrator of Anatomy at Guy's Hospital; Surgeon to the Hon. East India Company; and to the London Infirmary, for Diseases of the Eye.

[From the London Medico-Chirurgical Transactions, vol. V.]

IN the paper which I had last year the honour of reading to the society, I attempted to convey an idea of certain appearances by which the various textures of cataracts might be distinguished, and which appeared to me to afford juster indications than could otherwise be obtained, of the modes of operation which they respectively require. The present communication contains the further results of my observation on this subject.

The classification of the different species of lenticular cataract which I have ventured to suggest, is to be understood as general, comprehending of course their intermediate degrees of consistency. The fluid cataract, for example, upon rending

its capsule, is sometimes readily diffused in the aqueous humour, so as to render it uniformly milky—at other times it is viscid and oily, and sinks to the bottom of the chamber, resembling the onyx of lymph or pus in appearance. The gradations of consistency between this and the state of flocculency are less obvious, although their existence is not less certain. The caseous species comprehends, under the description of its characters formerly given, a range of considerable extent, from the softness of the flocculent to a degree of firmness approaching that of the hard cataract. The former has the permeability to the needle and the facility of dissolution of the flocculent cataract, without its symmetrical, or its fanciful cloud-like arrangement; the latter has a gum-like tenacity and incompressibility, upon which the needle makes but a superficial impression, and which renders it incapable of a change of figure, although it wants the colour and seeming compactness of that which I have denominated “the hard cataract.” These therefore I have regarded as the extremes of the caseous species. The appearances which they present differ according to the density of the opacity, which depends on their respective volume and texture. The best marks of discrimination, with which I am acquainted, are a uniform bright or luminous whiteness, and looseness or sponginess of texture, as indicating softness; and a dull white or bluish grey tint with a more condensed and less voluminous texture, the opposite state. There is an appearance of radii, corresponding to the segments into which the lens separates by maceration or compression, characteristic of the firm caseous cataract. These radii look like membranous bands passing at equal distances from the centre to the circumference of the lens. They are sometimes faintly marked, but always distinguishable, when present, from their superficial and glistening appearance. They are hence generally supposed to be capsular, but the capsule is uniformly transparent, and the cataract firm.

That a practical value attaches to these distinctions in selecting, and in the mode of conducting the operation, may be easily shewn, and my more matured experience has fully convinced me of their importance. In those of the fluid and flocculent character the diversity is insufficient to influence the mode of operating, and probably too minute to be ascertained by

previous inspection; and I am not aware that any advantage could be derived in the treatment of hard cataracts from a knowledge of their degree of hardness. But in attempting to couch the softer caseous cataract, the surgeon will find it break into pieces under the pressure of his needle; while, acting upon the firmer kind, his needle will sooner dislocate than divide it. This, it may be said, offers an alternative, of which equal advantage can be taken at the moment as by predetermination; for if the cataract prove soft, it may be broken up for absorption; if hard, the couching will be more easily effected. And this argument has been urged in preference of the operation with the needle over that with the knife, but it has been dictated by the necessity of the case, not by the judgment of the surgeon. I reply to it, 1st, That an unprepared state of mind, one that is undetermined which of two things it shall do, is the worst possible state for commencing an operation; for neither is done well, owing to an indecision which is the result of embarrassment between the two. 2d, That it is a severe disappointment to a patient to find, that in place of one he requires two operations, for the volume of the soft caseous cataract will require at the least two, and that he is to remain in darkness until the process of solution is effected; or on the other hand, though he receives light sooner than he expected, yet that it is succeeded by a severer inflammation, and a less perfect vision than he had been led to expect. I have myself caused such disappointments from mistaking the texture of the cataract, and have known patients who had made up their minds to one mode of operation, seriously regret that the other was adopted. The last and most important objection will be best understood when I have described the operations most applicable to the cases respectively. It will be at once admitted by those who agree with me, that a better operation than any with the needle is appropriate to one, if not to both cases; that the residence of the lens in the eye after its dislocation is an operation of all the most objectionable—destructive to the health and usefulness of the organ.

There is yet a description of lenticular cataract of too frequent occurrence to pass unnoticed, and which I shall call "the mixed cataract." I formerly adverted to the combination

of a fluid superficies with a caseous bed. Of this I have since seen several examples, and the instance of a caseous superficies covering a hard nucleus is yet more frequent. Wherever the centre of the lens has a tinge of colour, it is, according to my experience, a firm nucleus. It is faintly indicated, and discernible only on close inspection in different lights. It is discriminated from the hard cataract by its circumscribed extent and its obscurity, the surface through which it is seen presenting the general character of the caseous cataract.

A similar reasoning to that before employed is applicable here, and discovers the importance of ascertaining the existence of the mixed cataract before proceeding to the operation. The disappointment of the surgeon upon finding, after evacuating the fluid in one case, and breaking up the soft superficial lamellæ in the other, that much yet remains to be done, is not the greatest evil. The solid portion of lens, being unsupported by its capsule, advances, and a very serious and protracted inflammation results from its permanent pressure upon the margin of the pupil.

It has been a very general opinion among oculists, that the texture of the cataract is originally soft, and undergoes a progressive change from soft to hard. I am at a loss to conceive from what circumstances this opinion took its rise, unless from the observation that the texture of the cataract was different in persons of different ages.

The cataracts of infants and children are either fluid or flocculent; of young adults, usually of a flocculent or soft caseous consistence; of old persons, more frequently firm, caseous, or hard. Analogous to this is our observation of the texture of the healthy lens, which is semi-fluid in children, jelly-like in adults, and gum-like in old age. But is it to be supposed, that the progressive changes which accompany a state of organization and exercise, equally take place in the state of disorganization and disuse? I have operated on several congenital cataracts in adults, and have uniformly found them either fluid or flocculent.

The mixed cataract might possibly have suggested the opinion, that the cataract was in progress from soft to hard; but the same local relation of soft to hard is uniformly observed be-

tween the circumference and the centre of the healthy lens. I have never met with a soft nucleus covered by firm lamellæ.

The central opacity with a transparent circumference may have given or strengthened the impression; but the frequency of these cataracts in persons who, owing to the slight interruption which they give to vision, are ignorant of their existence until accidentally discovered, and their absolutely stationary character, lead me to the belief that they are congenital, and remain in the same state during life. Such persons have clear vision around the central spot. But persons in whom the disease is progressive, see through a mist, which they complain becomes more and more dense, before any opacity is distinctly visible. In a word, the consistency of the opaque lens, or portion of lens, does not admit of change when the opacity is once established. Whether fluid, or soft, or hard, it remains unchanged. If it originally affects only the nucleus of the lens, the circumference continues transparent.* This I imagine is referrible to its peculiar texture.

In general, at whatever period of life a cataract appears, it most nearly resembles the character in form and consistence proper to the healthy lens at that period. The doctrine of a progressive increase of consistency in lenticular cataracts, coupled with the inapplicability of couching or extraction to the soft cataract, has tended greatly to the prejudice of individuals afflicted with the disease. I have met with several unfortunate persons who have been kept in a state of blindness for years, under the expectation that their cataracts, supposed soft, would become *ripe*, (hard) and fit for an operation; which, until that change had taken place, was deemed unadvisable. “*Rusticus expectat dum defluat amnis.*”

* The opinion that a distinct nucleated cataract is progressive, has been, and is a source of serious mischief. The patient who reads his newspaper with the aid of glasses, and can bring down his bird at the distance of fifty or sixty yards, is rendered miserable by the assurance that he will be shortly blind, unless he submits to an operation. I am not stating an imaginary case. One gentleman who did me the honour to consult me in this state, neglected my advice, and has since felt a bitter sense of its value. Another has resisted the most urgent solicitations to submit to an operation. Without imputing to operators in these cases any unworthy motive, I intreat them to reflect upon their proceeding, and examine the evidence for their opinions.

In the operation of couching, the lens is completely dislodged from the circle of the pupil posterior to the iris, for which purpose it is necessary that it should break and occupy a space in the vitreous body. If the cataract is of the firm caseous or hard kind, it may be depressed entire; but the capsule should be rent by the depression of the lens, that the latter may be sufficiently supported to preserve its direction as it descends; for if the capsule be lacerated by the needle in front of the lens, before the act of couching is commenced, the lens is unsteady and apt to revolve, and thus evade the needle. It frequently happens that some of the external lamellæ of the lens shell off in the couching; these should be dispersed before the needle is withdrawn. Upon remitting the pressure in order to disengage the needle, it often happens that the cataract rises; in this case it should be again depressed by a motion of the needle somewhat abrupt, so as to hitch it in the breach of the vitreous cells. In this operation the eye is left in a state to appearance more perfect than in any which is succeeded by the instant admission of light. There is no wound of the transparent part, no sensible escape of aqueous humour; and if the cataract is depressed *en masse*, the pupil is clear, though somewhat smaller than before. The vision enjoyed at the moment is likewise more perfect than where the humour has been entirely discharged and the cornea is wrinkled; and the demonstration of it more satisfactory, as the experiment of opening and directing the eye may be made without risk. For these reasons this operation has always been a favourite with itinerant oculists. An opake capsule is more favourable for this operation than one that is transparent: first, because the operator sees at once the whole extent of the disease with which he has to contend; and secondly, because the lens is uniformly opake, and commonly reduced in bulk, if the cataract is of long standing. The transparent capsule more readily lacerates; but as it is highly elastic in its texture, a less extent of laceration suffices for the escape of the lens, and the extent of the laceration is not distinctly ascertained; so that a considerable portion of it may remain within the area of the pupil, in a day or two afterwards become visible from its opacity, and ultimately occasion a necessity for a second operation. Besides, where the capsule is transparent, the external lamellæ of the lens are often in the

same state, so that the pupil is loaded with fragments after the opaque portion has been depressed. These, however, as well as detached portions of capsule, are soon removed by absorption. A uniformly soft cataract, whether caseous or flocculent, cannot be couched; and although the nucleus of the mixed cataract may be depressed, the superjacent lamellæ will rise in the pupil and must be absorbed.

I have frequently performed this operation, and although my experience does not permit me to doubt that it is sometimes succeeded by useful vision, the same source of observation compels me to remark that the serious and lasting injury which the organ suffers, where the operation is satisfactorily completed, induces for the most part a slow but destructive inflammation, characterised by a tumid state of the palpebræ, a phlogosis and serous weeping of the conjunctiva, an immoveable and contracted pupil, muddiness of the humours, discoloration of the sclerotic towards its junction with the cornea, a periodical heavy pain in the region of the orbit, and a distressing sense of weakness in the organ. These symptoms are accompanied and succeeded by a dimness of vision very imperfectly relieved by glasses. In short, the condition of the eye, after the couching of an entire cataract, is too often that of a stationary imperfect amaurosis, the result of obstructed circulation and partial disorganization of the globe. This description will not be confounded with that of the acute inflammation, which directly supervenes upon most injuries inflicted by operation or accident. This I have seldom observed as a consequence of couching. On the contrary, the first few days are generally the best. The inflammation is comparatively slow in its accession as well as in its progress. I believe it results from the impediment to the internal or ciliary circulation, which the pressure of the dislocated lens creates. At least, I have repeatedly noticed the analogy between the morbid state of the eye produced by dislocation of the firm lens, whether accidentally in attempts to break down its structure, or designedly as in couching, whether its position be anterior or posterior to the iris. The choroid, and ciliary body, and iris, are the seat of the inflammation. When the lens, however bulky or firm in consistence, is extracted after its complete dislocation, no such inflammation ever ensues. When in process of time the lens,

favourably placed for solution, disappears, the organ recovers, though always slowly and imperfectly. The same process, which, during the pressure of the lens upon the iris, is visible to us—the effusion of lymph thickening and agglutinating its compressed fibres, and the deep discoloration of the sclerotic at its margin from the distension, or actual enlargement, and more abundant inosculation of the ciliary with the sclerotic and conjunctival orders of vessels—may afford us some idea of the effect of pressure and disturbed circulation in the choroid texture, and a probable explanation of the hidden mischief frequently done in couching.

But if we consider for a moment the theory of the operation, what more fortunate result are we entitled to expect from it? It would be a contradiction to all established principles in pathology to expect, that the opaque crystalline could be wedged in the substance of the vitreous humour, and the organ recover its health. For the lens, though dislodged from its capsule, being unexposed to the aqueous humour, does not at once undergo absorption, but remains of permanent form and bulk in the bottom of the globe; where, after the vitreous humour has become partially absorbed and obliterated by its residence, it may sometimes be seen, floating behind the inferior border of the pupil. In horses, the depression of the lens is by no means unfrequent, whether caused by a blow dislodging the transparent lens, or by a process of absorption consequent to its opacity. However the case happens, the eye looks shrunken and wasted; a considerable interstitial absorption of the vitreous humour is found to have taken place, and other marks of disorganization usually appear. The animal is in this state as permanently blind, as if the cataract occupied the area of the pupil. In a word, the principle of removing a part no longer useful, is for obvious reasons more eligible than that which suffers it to remain at the expense of other textures. And the hazard attending extraction, cautiously performed, does not in my opinion counterbalance the certainty of partial disorganization induced by couching.*

* A method of couching by passing the needle through the inferior margin of the cornea, has lately been practised by M. Langenbeck, professor of sur-

The extraction of the solid cataract, it can never be questioned, is, *cæteris paribus*, greatly preferable to its solution in situ. The former is effected by a single operation, the latter by a series; and the necessity of repeating an operation is an objection so weighty, as no equivalent short of unconditional security opposed to imminent hazard can reconcile; it must be always more or less permanently injurious to the organ. But on the other hand, the section of the cornea, to the extent of half its circumference, is an operation of the greatest possible delicacy, and in every stage of the treatment, so many unlooked for circumstances may, and occasionally do arise to baffle the intention of the surgeon, and expose the organ to irretrievable injury, that we cannot be surprised at the disposition evinced by men of honest minds and mature experience, to seek a substitute for the precarious advantages of dispatch and brilliancy of effect, in measures of slowness and safety.

Circumstances unfavourable to the operation of extraction are occasionally combined with forms of cataract, to which it is otherwise well adapted. One of the most formidable of these, as it appeared to me when I commenced the practice, was the convexity of the iris, and consequent narrowness of the anterior chamber, where the lens was bulky and of firm consistence. It is evident, that this figure of the iris will either materially limit the section of the cornea, or expose the iris to be wounded in the section. Frequently meeting with this difficulty, induced me to vary the mode of operating thus:—I first employed the belladonna to dilate the pupil, and then introducing a small spear-shaped needle behind the iris, I slit the capsule down the front of the lens perpendicularly, and repressed with my needle the superior margin of the lens, by which pressure its inferior margin was raised, and easily tilted over the edge of the dilated pupil, into the anterior chamber; here I left it resting against the cornea, and withdrew my needle. The eye was then closed, and a napkin thrown over it. After a minute or two, the upper lid was gently raised, and I made my section

gery at Gottingen, as I am informed by Dr. Mühry, physician to the king at the court of Hanover. I regard the operation as radically wrong in principle, and shall therefore be excused from a discussion of the merits of this, or any other mode of performing it.

boldly upon the lens, in conformity to the surgical practice of cutting upon an extraneous body, previously secured. By the interposition of the lens, the iris was effectually protected, and the cataract readily escaped as soon as the section was completed. This operation, which it will be seen differs from that of extraction as hitherto done, chiefly in having its stages reversed, I performed several times without difficulty, and with good success: the patients had no more than ordinary inflammation, and recovered excellent vision.* But in the progress of my experience, I found the pupil vary in its extent of dilatation under the influence of belladonna, and where the external lamellæ of the opaque lens were soft, as in the mixed cataract, I found them separate under the pressure of the needle, which increased the difficulty of throwing the nucleus, as it sunk away from the pupil, into the anterior chamber. To remove the fragments of the cataract, it appeared superfluous to make the entire section of the cornea; I therefore carried the knife only half across the chamber, and withdrew it. The fragments floating in the aqueous humour, were at once evacuated with it; and upon introducing the scoop, and gently depressing the outer margin of the pupil with the back of it, the remaining portion was readily conducted along its groove, as the contents of an abscess follow the director. The success of this operation obtained more than once under circumstances nearly similar, the clearness of the pupil, and the perfect state of the iris, furnished a suggestion not to be overlooked, and led to what I am disposed to regard a material improvement in the operation for soft cataracts. I began my operation, having previously dilated the pupil, by the quarter section of the cornea, dipping the point of the knife into the pupil, and freely lacerating the capsule before withdrawing it. The fluid cataract was instantly evacuated with the aqueous humour. The flocculent cataract frequently passed out entire, taking an oblong shape, and the soft caseous cataract, piecemeal, through the hollow of the scoop, on gently depressing the margin of the pupil and sclerotic.

* I have a well written letter full of gratitude from one of these patients, a man between sixty and seventy, now before me, on both of whose eyes the operation was done in this way a twelve-month ago.

If the pieces were not all evacuated, the introduction of the capsule needle was found sufficient to clear the pupil, or they disappeared in a few days by absorption. The operation may be performed experimentally on the dead eye, and will be found to admit of the easy escape of the lens piecemeal.

One advantage of this operation over that which invites the solution of the cataract, is too obvious to require pointing out. Such an operation effects the object, which on an average requires two or even three of the latter. Its greater simplicity, and superior safety to that of extraction as commonly performed, appeared to me so decided, that I anxiously endeavoured to substitute it in cases of hard cataract. The first stage of the operation in this case consisted in dividing the lens by the needle introduced through the sclerotic tunic. The second, after a pause of two or three minutes, of the section of the cornea to the extent required for the extrication of the fragments by the scoop, which was introduced with its back to the iris, and very gently pressed upon the outer margin of the pupil. I soon found, however, that the firm lens could not be reduced to fragments, without a greater exertion of force, and the continuance of it for a longer time, than was consistent with the safety of the organ; and being inelastic, that it would not in any degree alter and accommodate its figure, and therefore required a section somewhat exceeding in extent its greatest diameter. And though the use of a larger and more powerful instrument might enable the operator to cut it in pieces—not to speak of the extent of injury which the use of such an instrument inflicts—the complete escape of the aqueous humour which follows its removal, and the consequent collapse of the cornea and iris, render the section of the former impracticable. Even if this were not the case, if the firm cataract were divided and subdivided, I greatly doubt if the pieces of a lens of this consistence could be extracted with facility through a simple incision of the cornea; and with the operation by which it is removed entire, this would certainly not admit of comparison.

The operation which I have described is similar to that performed and recommended in cases of soft cataract, by the late ingenious Mr. Gibson, of Manchester; whose death, like that

of all young men, ardent and able to improve their opportunities of information, must be regarded as a serious public calamity. Mr. Gibson's proposal was to extract the soft cataract through a large puncture or small incision of the cornea, having broken it in pieces by a former operation with the needle. But I do not find this previous measure necessary. This texture of cataract yields at once to the point of the knife or the curette. I have detailed the process of observation, by which I arrived at the operation, and had not recollected until reminded by a friend, that a similar plan had been adopted by Mr. Gibson. I am very happy to do him the justice of acknowledging his priority, and am every way gratified to discover, that although our observations were independent of each other, they conducted us to similar conclusions. I have performed this operation successfully upon infants, and where the capsule is opaque and unadhering, I am disposed (provided the eye be not very unsteady, or the infant very unmanageable) to prefer it to the needle. But if the capsule is transparent, its contents are generally fluid, or of a consistence almost as permeable and easy of dispersion, and the operation with the needle passed through the cornea performed by the late Mr. Saunders, is, if properly executed, unexceptionable. I admit that in this operation there is less risk of injuring the iris, and deforming the pupil by adhesions. The needle is likewise a more convenient instrument than the knife for the free laceration of the capsule.

Where the contents of a transparent capsule are evacuated by an aperture of insufficient extent, as for example, a puncture, the membranous cataract which supervenes is very difficult of cure. The capsule heals, becomes adherent to the iris, and acquires a toughness which resists the needle. The iris yields to the pressure of the needle upon the capsule, and increases the difficulty. In such a case the operator should work at the centre of the membrane, and not attempt to break down the adhesions for the purpose of removing it entire. But by the completion of the capsular aperture in the first operation, the occurrence of a membranous cataract is effectually prevented.

Where the quarter section is performed, the knife should be carried somewhat obliquely through the lamellæ of the cornea, *i. e.* its point should be inclined to the pupil as it enters,

and should be withdrawn gradually, not hastily, after the capsule has been rent: but the operator should not begin to withdraw it until this object is accomplished. By these precautions the aqueous humour is retained, and the pupil preserves its dilatation, till the cataract is set at liberty; and the prolapsus iridis, which in neglect of them will sometimes occur, is effectually prevented. Where the capsule is opaque, it generally escapes with the lens, and not a vestige of it can be seen within the pupil. In operating upon the adult after this manner, the surgeon should be careful to ascertain that the cataract is either fluid, flocculent, or of the softest caseous kind. If he should find that he has mistaken a firm for a soft cataract, the section of the cornea must be completed. The point of the knife should not penetrate the cornea at a less distance than one line from its margin, in any operation for which it is used.* If the iris should prolapse, it must be gently replaced with the back of the scoop. This may be done, if unfortunately it has not been sooner discovered, even as late as three or four days after the operation, as the adhesions are recent, and will yield to gentle pressure; upon the evacuation of the aqueous humour, the iris resumes and retains its place. But if the iris prolapses after the patient is bandaged, and put to bed, it takes place during the period of the secretion of the aqueous humour, being caused by the accumulation of this fluid behind it, which protrudes its overstretched fibres in the form of a little sac or bag between the lips of the wound, before the process of union is completed.

As it is of importance to the recovery of the pupil, as well as the healing of the wound, and the prevention of an acute inflammation, from the irritation which this protrusion causes, that it should be as early as possible replaced, I never permit the eye, in which from any cause the iris has prolapsed at the time of the operation, to remain unexamined on the second day, by which time the humour is secreted, for the purpose of ascertaining that the pupil is shapely, and the cornea healing. No evil results from this examination; but as the accident is

* The disposition to prolapsus iridis is increased, if not induced, by carrying the section too near to the margin of the cornea, by which its basis is deprived of support.

liable to occur in this interval, and cannot be redressed with equal ease or advantage at a later period, if at all, it should in no case be omitted.

I embrace the opportunity which this paper presents, of making a few remarks on the operation of extraction, as applicable to cataracts of firm consistence, in the hope that they may be useful to those who undertake it. It is quite unnecessary to offer a systematic description of its stages, after the copious and valuable instructions which the profession have received upon the subject from Richter, the Wenzels, and Mr. Ware. To convey an idea of the importance of performing this operation in that manner which admits of the removal of the cataract with facility, I need only remark, that I have never seen any extraordinary or untoward inflammation ensue, where the operation was so conducted. On the other hand, that I have scarcely ever known an instance of difficulty in the removal of the lens, in which the object of the operation was not in a great degree frustrated, or which was not succeeded by considerable inflammation, and consequent disorganization and deformity. The result being thus influenced by the circumstances of the operation, it becomes important to know from what cause the extraction is rendered difficult, and what the ill consequences are of which it is productive.

The cause of difficult extraction is an insufficient section of the cornea; the ill effect of it is the implication of the iris in the wound. I was formerly at a loss to know, why, after a tolerably well formed section of the cornea, and a sufficient aperture of the capsule, the lens showed no disposition to advance, upon applying a moderate pressure to the globe. By increasing the pressure in such a case, I found that the capsule of the vitreous humour yielded, and a portion of that humour escaped; the cataract having lost its support, sunk away from the pupil, and every introduction of the curette, hook, or scoop, increased the discharge. At other times, the lens advanced upon pressure of the globe, as it were reluctantly, became wedged in the section of the cornea, and was, by the continuance of the pressure, gradually but difficultly squeezed out.

In the first of these cases the section was not only not of extent sufficient for the mechanical expression of the lens, but the

divided portion of cornea formed so small a part of its circumference, that its resistance was but slightly diminished; and, except that the aqueous humour was evacuated, it in effect retained its integrity. In the second case the lens advanced, because this resistance was either greatly diminished or taken away, although the section was demonstrated to be barely sufficient for the escape of the lens. When I speak of the resistance of the cornea to the escape of the lens, I refer to its figure and its relation to the pupil through which the lens is to pass. It will be understood by observing the difference of effect produced by sections of the cornea, of the same extent, opposite to and at the greatest distance from the pupil. It is evident, that the situation of the section will be more favourable to the escape of the lens, the nearer it approaches to the pupil. I have seen some dexterous operators perform a straight section which just cleared the inferior margin of the pupil. Now if a crescentic section of the same extent were made at the inferior margin of the cornea, the extraction of the cataract could not be accomplished. The cornea being in the former case divided at its greatest diameter, its resistance is taken off, and therefore the lens will readily advance through a sufficient aperture of its capsule, although the wound of the cornea is obviously too confined;* but in the latter, the cornea retaining two-thirds of its circumference entire, the effect of pressure is only to preserve the contact between the iris and cornea, which took place on the evacuation of the aqueous humour, and to render the cornea a perfect valve upon the aperture of the pupil. That this is the effect it has, is demonstrated by a common occurrence, viz. the bulging of the iris at the inferior border of the pupil. The lens, upon pressure of the globe, being unable to pass the pupil, pushes this membrane before it, where it has lost its support by the division of the cornea. The operator, observing this, supposes that the capsule of the lens is imperfectly opened, and it may be so; but if it were removed entire from the face of the lens, the same thing would happen, and

* I am far from meaning to commend a section parallel to the lower border of the pupil; the fact is merely stated, that the reason may appear why the section of a proper situation and figure should also be of a proper extent.

continued or increased pressure have no other effect than that of continuing and increasing the distension and protrusion of the iris. If the section of the cornea be equal to its semicircumference, the effect of pressure is to dilate the pupil, and permit the escape of the lens. The iris has been supposed in some cases to resist the passage of the lens, and it is probable the opinion may have arisen from a circumstance similar to that which I have endeavoured to explain; but the truth is, that the iris is perfectly passive, and never, in my belief, forms an impediment to the passage of the lens, where it has lost the support of the cornea.

To give the section the situation and extent required, it should describe a curve similar to that of the margin of the cornea, equi-distant about one line from the sclerotic, commencing at the same distance above the transverse diameter of the cornea, and terminating a little below that diameter on the opposite side.

Incised wounds of the cornea are well disposed to heal by the adhesive inflammation, and the structure of that membrane is favourable to the close and complete apposition of their edges. A portion of the lymph uniting the cut surfaces is generally effused between the conjunctiva and cornea to a small distance beyond them, but this is in a little time absorbed, and the cicatrix becomes but faintly visible, forming a very delicate opake line. But if the lens has been forcibly delivered by a small section, the iris is compressed and bruised in its passage, and instead of recovering its plane, the lower border of the pupil falls between the edges of the wound, and partakes of the inflammation raised to heal it. It does not actually prolapse, but, by its intervention of the edges, forms a part of the cicatrix, so as to elevate the flap, and distort the figure of the cornea, and by its co-adhesion with the latter to render it more or less extensively opake from the section upwards. This tendency of the iris to inflame and unite with the cornea is universal, where it has been stretched, compressed, or bruised by the lens in its passage; the injury is often aggravated by the use of instruments to open the capsule and extricate the lens, which entangle in the iris, or abrade the cornea on its interior surface, so that the opacity eclipses the pupil; but where the iris has

been bulged and protruded by the lens during the operation in the manner before described, the prolapsus which ensues is sometimes of such magnitude as to draw the upper segment of the pupil into the wound, and thus completely to close it and obliterate the anterior chamber.

I have now pointed out, as faithfully and as clearly as I am able, what has appeared to me to be the principal cause of the difficult extraction of the cataract, and its consequences. The means of preventing it are sufficiently obvious; and it will be sincerely gratifying to me, if these observations should spare others the painful necessity of occasionally witnessing evils which they might have prevented, but are unable to relieve.

It is difficult in speaking of an operation, in the conduct of which so many minute circumstances demand attention, to refrain from entering into detail. On such points, however, few persons can be instructed with advantage, for all are competent, and in the course of their experience, compelled to form a judgment of their own; which will be more readily and more accurately formed by an appeal to practice than to books. One observation only, I will add, of general importance to the perfection of the operation. Some surgeons simply incise the capsule near to the lower border of the pupil, for the egress of the lens, and leave the remainder of it entire, occupying the centre of the pupil, in the expectation that it will remain transparent. This is not realized by the event; the capsule invariably turns opake after the escape of the lens, and renders the operation, for a time at least, imperfect. Whatever operation for the cataract is selected, whatever instrument is employed for the aperture of the capsule, it is essential that the central portion of this membrane should be extensively lacerated. To conclude, the operation of extraction by the section of the cornea in its semi-circumference, is the only one properly adapted to the firm caseous and hard cataract. Although pregnant with fortuitous and unexpected circumstances, embarrassing to surgeons, who have not enjoyed frequent opportunities of performing it, it offers no difficulty which coolness and perseverance will not soon overcome; and when executed with the confidence and adroitness which experience will infallibly give, it is, whether considered in design or in effect, one of the most

unexceptionable, if not the most perfect of our performances, in the department of operative surgery.

The following is a concise summary of the contents of this and the preceding memoir.

I. The various textures of cataract admit of distinction into capsular and lenticular, single or in combination. The lenticular cataract is either fluid, flocculent, caseous, hard, or of mixed consistence.

II. To the two former and the soft of the caseous species, the operation of forming a central aperture in the capsule, for the solution of the lens in the aqueous humor, is well adapted: to the firm of the caseous species and the two latter it is inapplicable.

III. The introduction of the needle through the cornea is preferable to passing it through the sclerotic, in performing this operation; except when, in consequence of a previous operation, or from other cause, the capsule is opaque, and the lens has undergone a partial absorption, and lies at a distance from the pupil.

IV. The operation of couching, which is, strictly speaking, applicable only to firm caseous and hard cataracts, is objectionable on account of the injury done to the organ, admitted in the theory of the operation, and evidenced by a destructive inflammation, and an ultimately impaired state of the retina, by which it is frequently succeeded.

V. Where the space occupied by the aqueous humour is narrowed by the considerable convexity of the iris, the firm cataract may be dislodged from its capsule, placed in the anterior chamber by the needle, and safely extracted by a section of the cornea.

VI. The fluid, flocculent, soft caseous and unadhering capsular cataract, congenital or adult, may be safely and expeditiously extracted through a quarter section of the cornea, by freely opening the capsule with the point of the knife, and afterwards depressing the margin of the pupil with the back of the scoop.

VII. The extraction by a quarter section should never be

attempted but in cases where the consistence of the cataract is manifestly soft, as its success depends on the susceptibility of the cataract of a change of figure, or its ready escape piecemeal. It is better adapted to the opaque capsule if unadhering, than the operation with the needle.

VIII. Where the capsule of the fluid, flocculent, and soft caseous cataract is transparent, the operation of extensively rending it and dissipating its contents with the needle passed through the cornea, is efficient, and leaves the pupil in the most perfect state.

IX. The mixed, firm caseous, and hard cataract require the section of the cornea in its semi-circumference, being unsuspceptible of an alteration of figure.

X. The inflammation which follows the *easy* extraction of the cataract is never hazardous, very seldom severe. That which ensues after the *difficult* extraction, frustrates in a great degree, if not entirely, the object of the operation, though the cataract be completely removed.

XI. The cause of the difficulty is the insufficient aperture of the cornea; the consequence of it, the implication of the iris with the wound of the cornea, and the participation of the former in the inflammation of the latter: the consequent co-adhesion of the two, and the partial or total obliteration of the anterior chamber, with diffused opacity, greater or less, of the cornea.

XII. The principle of the operation of extraction is unexceptionable: the section of the cornea should be every where about one line distant from the sclerotic; it should be crescentic, and should commence on a level with the superior border of the pupil. The aperture of the capsule should be large and central, by laceration, not by incision of that membrane.

I trust that the observations contained in this paper, may afford satisfactory evidence of the justness of the principle, which I have endeavoured to establish. I by no means assume, that my experience is sufficiently extensive, or my description and arrangement sufficiently accurate, to lead the surgeon up to a prompt and unfailing decision of the most appropriate operation in every case. The subject probably does not

admit of being reduced to unerring rules.* I have, however, pointed out a path, which I believe may be pursued with advantage; and if these observations should induce attention to the subject, I entertain no doubt that the several textures of cataract will ere long be distinguished with accuracy, and that thus the discretion of the surgeon, becoming subservient to his art, will render it in the highest degree efficacious.

* "Simple views, whether of health or disease, however ingenious, can seldom be just. They have their origin in the spirit of system, not in the careful study and faithful enumeration of the various and complicated circumstances, which concur in the production of all vital phenomena."—*Thomson's Lectures on Inflammation.*

SELECTED REVIEWS.

Observations on Pulmonary Consumption,

BY DR. SOUTHEY.

[From the London Monthly Magazine, for April, 1816.]

IN our Bills of Mortality are registered only those births and burials which take place in London, and 12 miles around it; yet in this little spot of our island, in this fragment of our population, between 5 and 6000 persons annually die of consumption. Holycross, a little village in Shropshire, long held a population of only 1050. During the ten years between 1750 and 1760, forty-seven of its inhabitants died of consumption; but, from 1760 to 1770, there died of the same disease one hundred and one: in the former period it caused one-sixth, but in the latter one-third of the total mortality of the place. During seven years, between 1790 and 1796, six hundred and eighty three persons died of consumption at Bristol, and its relative mortality was as one to two; at Plymouth, during the seven years from 1799 to 1808, the relative fatality of consumption was as one to four.

When the kingdom is unusually healthy, there annually dies one out of every forty persons; if consumption does one-fifth of the whole work of mortality, of every two hundred inhabitants one dies consumptive every year. The total population of these islands has been moderately calculated at 16,000,000; consumption, therefore, annually destroys 80,000; thus, every day that passes over us, thirteen persons die of this disease in the metropolis alone, and upwards of two hundred and forty in the whole kingdom.

But figures never affect the feelings; numerical calculations go on in an unsensitive part of the mind; we cannot reckon and imagine at the same time. To place in a striking point of view the amount of its ravages, an eloquent writer, Dr. SOUTHEY, directs his reader to "ascend one of the high hills

that surround Bristol, to remark how closely the buildings are crowded together, for an extent of some miles; to descend from the eminence, and walk through its populous streets; to calculate the multitude that are met on the walk, and the still greater multitudes who are at the same time within the houses; and, when the imagination has thus grasped the idea of an immense assemblage of human beings, he is reminded, that a number equal to this assemblage perishes annually in our own island of this devouring malady."

What remedies have we for this disease? It has prevailed so long, and is occurring so perpetually, that the knowledge and the resources of the profession must have found their way to the public; and, we believe, they are pretty well aware, that, when consumption is fairly and fully established, there is no remedy on which we have the smallest reliance for efficacy, and that the greater number of medical practitioners aim at little more than alleviating the sufferings, and managing the minds of their patients; or, if they ever go further, and prescribe any of those remedies from which more sanguine spirits have promised a complete recovery, it is as a forlorn hope, and without the faintest expectation of success. In truth, there is at this time, throughout the profession, a hopeless indolence upon the subject. Physicians have no faith in their present remedies, and the subject is so unpromising, that they feel little inclination to search for new ones. This state of opinion must inevitably influence the conduct of the profession, and the patient, in return for his confidence and his fees, gets little more than prescriptions that have no power, and visits that carry no comfort.

The following statement of the varieties which occur in strumous phthisis, is well calculated to be highly interesting and useful to those practitioners who have had less extensive experience of the disease than Dr. Southey, or who are accustomed to regard it with a less scrutinizing eye.

"Sometimes the disease proceeds to its fatal termination without any pain in the chest, even upon the full inspiration. The difficulty of breathing also varies greatly; in some instances, the respiration becomes hurried and laborious, and all the auxiliary muscles are exerted early in the disease. In other

cases, the patient will require but a single pillow in the last stage. The dyspnœa sometimes becomes less after the suppuration has commenced. I have known two cases, in which the uneasy sensation in the throat was one of the most distressing symptoms, the patients being unable to swallow any thing solid for some weeks before death. Portal records several cases in which the voice failed, and the organs of deglutition were affected; and, upon dissection, no change of structure could be discovered, except in the viscera of the thorax. The rapidity and degree in which the body wastes, vary in different individuals. In most instances, this is one of the first circumstances which excite alarm; but sometimes even this symptom is wanting, and fat has been found around some of the viscera of those who have died consumptive. The expectoration of pus, which, if any one symptom could deserve the name, might be considered a diagnostic of the disease, is not always present. In some instances, abscesses, which have proved fatal, have been found in the substance of the lungs, not communicating with the air-cells. Concretions of different kinds are often expectorated by phthisical patients, sometimes fleshy, sometimes osseous, and occasionally resembling a portion of the bronchia. Tulpius asserts, that he has seen pulmonary concretions, in which vascular ramifications could be distinctly traced. The membranous substances often expectorated, and mistaken for portions of lung, are probably of the same nature as those which are formed in the larynx, and upper part of the trachea in croup. In one case of a young man, whom I attended in strumous phthisis, there was no expectoration of any kind till within a few days before his death; but, during the progress of the disease, he used frequently to vomit, after a violent fit of coughing, and then discharge a considerable accumulation of mixed pus and mucus. The exacerbations of fever are often well marked, but occasionally very irregular, and sometimes so slight as not to be noticed. I have seen one case in which no rigors were ever experienced, nor any profuse perspiration, till the last week. Aphthæ not unfrequently appear in the last stage. Morgagni, and more recently Portal, asserts, that some individuals have died of pulmonary consumption without ever having coughed. '*Est enim,*' says the former, '*aliquando in*

pulmonibus materia peccans nec pauca, et quæ expelli possit; sed nulla est tussis propter hebetem ac deficientem sensum in tunica intima bronchiorum.' The symptoms of strumous phthisis are therefore infinitely varied, and rarely occur in the exact order and connexion in which they are described by authors."

After describing the progress of the disease, the constitution in which it occurs, and the symptoms by which it is characterized, Dr. Southey proceeds to enquire into its external causes, beginning with a medical survey of the globe, in order to ascertain the degree in which consumption prevails in different regions; and those circumstances, such as climate, clothing, food and habits, to which its greater or lesser prevalence is to be attributed.

Dr. Southey sets out from the northern extremity of Europe. Honebow, Olafsen, and Povelsen, Sir George Mackenzie, and Mr. Hooker, all agree that consumption is one of the most prevalent diseases of Iceland; it is attributed to the severity of the climate, the hardships to which the inhabitants are exposed in fishing, and the little care they take to avoid wet and cold. Linnæus, in his Tour in Lapland, asserts, that among the Laplanders pleurisies are very common, but that consumption occurs only now and then. Dr. Guthrie and Dr. De Mertan practised many years in Russia, and assert, that pulmonary consumption is not a frequent disease there; the same also appears to be the case in Denmark. We are in the habit of associating together cold and consumption; this immunity from the disease in climates where the cold is so much more intense than in our own, is attributed by Lord Molesworth to their warm stoves, and the plenty and pureness of their beech-wood fuel, while its prevalence in London is referred to the gross and unwholesome fumes of our coal-fires. In the north of Germany, pulmonary consumption seems nearly as prevalent as in England; if you talk to a German, he is as familiar with *lungensucht* and *auszehrung*, as we are with consumption. In 1804 one-fifth of the deaths in the hospital at Berlin arose from consumption. The Dutch have a climate not warmer than ours, and their apartments are said to be large, airy, and what an Englishman would think chilly. Yet Dr. Cogan, who practised some years at Rotterdam, states,

that they are comparatively exempt from this disease. Finke, in his Medical Geography, makes a different statement, (on a Dutch authority:—“*Verhandelingen van de natuur en geneeskundige correspondentie opgericht in s' Hage.*” S. 98.) That, at the Hague, out of 1457 deaths, three hundred and eleven are from consumption; that is, more than one in five; and at Bergen-op-Zoom, out of one hundred and fifty-seven deaths, thirty-nine from the same disease; that is, nearly the same proportion: if, however, we may place any reliance on the assertions of Hollanders in this country, there can be no doubt of its comparative unfrequency among them. At Vienna, some say one-sixth, and others one-tenth of the deaths arise from consumption. In France, the disease appears to be prevalent, and is attributed by Finke to the thin dresses of the natives. The women (says he) think they must be ill to be interesting. “*J’ai aujourd’hui une santé indecente,*” says a lady who feels herself thoroughly well; and in the spring, whatever may be the weather, they put on thin summer dresses, catch colds, and go into consumptions. That consumption is frequent at Paris, the evidence of Portal is sufficient,—at this very time, one of the most eminent physicians in the French metropolis. The south of France is often considered as a favourable climate for consumptive patients. Yet, at Lyons, the summer is very hot; the winter very cold, and diseases of the chest, particularly consumption, are frequent. Formerly, the consumptive in England were sent to Montpellier. Smollett long ago said, “that this senseless custom yearly costs many lives.” “In Dauphiné, says Thierry, *Erfahrungen*, W.S.W.S. 44. the neighbouring Alps cause diseases of the chest; whoever has weak lungs, does not last long there; the dry tempestuous winds cause blood-spitting and consumption.

Consumption is well known throughout Italy; in the hospital of Santa Maria Nuova, at Florence, fitted up for 1200 patients, Domier found a number of consumptive. In Spain, it is well known, and is believed to be contagious; the bedding and clothes of those who die of it are burned; the same is the belief and practice of the Portuguese; they send their consumptive patients from Lisbon into Allentejo, particularly to Beja. The Maltese themselves are not subject to consumption,

but consumptive patients from England are injured by the climate; the same is said to be the case with Sicily, where the disease is known and believed to be contagious. The inhabitants of the Archipelago seldom suffer from pulmonary affections. In Egypt, the disease seems to be unknown; most travellers are silent about it; and Savary states, that it does not occur there. Celsus considered the climate of Alexandria as well suited to the phthisical. At the Cape of Good Hope, we learn, that consumption was one of the diseases most fatal to the English settlers. In Bengal, it is not common; though, in a European regiment stationed at Bombay, about six cases occurred annually. Chardin says, that the Persians are not subject to pulmonary complaints.

Crossing the Atlantic, Dr. Southey takes a view of the new continent.—“The Greenlanders (says Crantz) are subject to consumption and blood-spitting; many drag along several years with a weakness and defluxion on the breast, that suffocates them at last.” In Canada, pleurisies appear among the prevailing diseases; consumption is not mentioned. Among the northern Indians, according to Hearne, it carries off great numbers of both sexes and all ages. In New England, it is very common; before the arrival of the English, it was one of the two disorders most fatal to the American Indians; and this is attributed by General Lincoln to the disuse of furs, which they sold instead of wearing. At Boston, consumption and dysentery are said to be the diseases of the place, and are attributed to obstructed perspiration. In Portsmouth, in New Hampshire, it appears that one-fifth of the deaths are caused by pulmonary consumption, and that it destroys in the same proportion at New York, and nearly the same at Philadelphia. According to Volney, among the most prevalent diseases throughout the United States, are colds and coughs, frequently terminating in consumption. In the West-India Islands, consumption is by no means a common complaint. In Jamaica, according to Hunter, it hardly ever occurs; and Lempriere says, that the climate was most favourable to the scrofulous, and those affected with pulmonary complaints. Du Tertre and Bryan Edwards corroborate the statement, that the disease is almost unknown in the West Indies. It is better known in

Barbadoes than in any other of the islands. Phthisis is common at Bermuda and the Azores. At Madeira, it appears, that it is one of the diseases to which the natives are most subject.

One of the first things which strike us in those nations, among whom consumption is most prevalent, is the deficiency of their clothing. The people, in the north of Europe, it is true, live in a climate of far greater inclemency, but how do they guard against the severity of the cold? (Phil. Trans. vol. 68.) "The legs and feet (says Dr. Guthrie, describing the winter dress of the Russian boor) are guarded against the cold by many piles of coarse flannel, with a pair of boots over all; at the same time, that their bodies feel all the warmth of sheep-skin coats, and nothing is left open to the action of the air but the face and neck; his wooden hut is caulked with moss, snug and close; it is furnished with an oven, which answers the triple purpose of heating the house, dressing the victuals, and supporting on its flat top the greasy matrass on which he and his wife lie; in the same apartment sleep the children, and secondary personages of the family: they undergo, during the night, a most stewing process from the heat and closeness of their situation; insomuch, that they have the appearance of being dipped in water, and raise a steam and smell in the room not offensive to themselves, but scarcely supportable to the person whom curiosity may lead thither." How different this to our thin clothing, and half-warmed apartments. In certain parts of our own island, consumption is said to have been more prevalent, as the clothing has become scanty. In many parts of Scotland, (says Sir J. Sinclair,) where consumption is now prevalent, the old people affirm, that it was unknown before the warm Scotch plaiding was exchanged for the fine, thin, cold, English cloth, and woollen for cotton. So, in the vale of Keswick, it has been observed, that consumption has increased with the increased use of cotton among the women, instead of worsted, flannels, and stuffs.

But, in our mode of living, thin clothing is not the only circumstance which disposes to consumption; some classes of our countrymen appear to be almost wholly exempt from it, while others suffer peculiarity. Those who are most exempt,

are those who eat animal food, live well, and whose occupation leads them to take strong exercise in the open air, such as butchers, Scotch fish-wives, Cornish fishermen, stable boys, grooms, and dragoons. Those classes suffer the most severely who are the worst fed, and lead sedentary lives, as tailors, weavers, spinners, &c.

These inferences are not without their value: to a people who suffer so severely as the English from pulmonary consumption, it is of importance to know, that the chief victims of this disease are not those who live in the most inclement climate, but those classes of a temperate climate, who are the worst clad, the worst fed, and the worst exercised; and that warm clothing, nourishing diet, and regular strong exercise, prevent that delicacy of constitution which disposes to the disease.

A General Dispensatory, or Arrangement of the Pharmacopœias of London, Edinburgh, and Dublin; in which the strength of various preparations is expressed by Pharmaceutical numbers; the different synonyms of each article, doses, qualities, Chemical numbers, &c. are likewise added: and to the whole are prefixed, some Observations upon the present state of the nomenclature of Pharmacy. BY S. ROOTSEY, F.L.S. Bristol, printed for Baldwin, Cradock, and Co. London. pp. 142.

[From the London Medical and Physical Journal, for February, 1816.]

THIS is one of the most extraordinary little books we ever remember to have met with in the progress of our labours. In the space of about one hundred and fifty pages, more than half of which are devoted to *materia medica* and index, the author has actually accomplished all that he promises in his long title-page. After this observation, our readers will not expect us to offer an analysis of what is expressed with as much brevity as possible, and perhaps even in fewer words

on some occasions than could be wished. The title itself too shows the intention of every division. We must, therefore, content ourselves with short extracts, to show the manner in which so much is compressed into so short a compass. The preface will assist us a little; and, as it is short, we shall transcribe the whole.

“In writing the following work, my principal object was to explain my method of expressing the composition and the strength of various medicinal preparations by means of pharmaceutical numbers; and having been for some time in the constant use of what I conceived to be a more philosophical language of pharmacy, I determined upon uniting both of these ideas in one publication, and printing them in the form of a dispensatory as they now appear.

“The former presents us advantages so important and so obvious, that I consider no apology can be necessary for my making it known. But, as my own opinion of the necessity of nomenclatural reform may not with my contemporaries possess any weight, I shall adduce the opinions of some of those philosophers who are justly considered as high authority.

“I have been stimulated in my undertaking by the advice which the illustrious Bergman once gave to M. de Morveau: ‘Spare no improper names, those who are learned will always be learned, and those who are ignorant will thus learn sooner.’ And I may also urge as relevant to this point the arguments of the unfortunate Lavoisier, whose zeal and freedom in the promotion of science have never been surpassed. ‘As ideas,’ he justly observes, ‘are preserved and communicated by means of words, it necessarily follows that we cannot improve the language of any science without at the same time improving the science itself; neither can we on the other hand improve a science without improving the language or nomenclature which belongs to it.’

“Sir H. Davy, who has devoted much of his attention to this subject, likewise judiciously remarks (p. 46 of his *Elem.*) that ‘a theoretical nomenclature is liable to continued alterations; *oxygenated muriatic acid* is as improper a name as *dephlogisticated marine acid*; every school believes itself to be right; and if every school assumes to itself the liberty of alter-

ing the names of chemical substances in consequence of new ideas of their composition and decomposition, there can be no permanency in the language of the science, it must always be confused and uncertain.' And in his advertisement he says, 'till a more simple system is adopted, innovation will be censured, sometimes perhaps even when it is necessary, and nomenclology generally brought forward as a reproach.'

"But still more weighty and impartial may appear to some, the arguments of Bacon and Locke, who flourished at an earlier period, and whose luminous writings have served, and should still serve, as a compass to direct our course in the promotion of philosophy. To those who possess the philosophic spirit of the former, or who are acquainted with his works, it will be unnecessary for me here to adduce what he has said '*de Idolis Fori*.' And the latter has given us, in our vernacular tongue, several excellent rules as criteria of the imperfection of any particular language (of pharmacy for instance,) which are so much to the present purpose, that I cannot forbear to conclude with the following transcript from his essay upon the human understanding.

" 'The ends of language,' he remarks, 'being chiefly these three—1, to make known one man's thoughts or ideas to another; 2, to do it with as much ease and quickness as possible; and 3, to convey the knowledge of things;—language is either abused or deficient when it fails of any of these three.' After treating at some length upon certain abuses, he thus proceeds:

" 'To remedy the defects of speech before-mentioned in some degree, and to prevent the inconveniences that follow from them, I imagine the observation of these following rules may be of use. 1. A man should take care to use no word without a signification, no name without an idea for which he makes it stand. 2. The ideas he annexes to his words, if they be simple, must be clear and distinct; and, if complex, determinate. 3. Care must be taken to apply words as near as may be to such ideas as common use has annexed them. 4. Because men, in the improvement of their knowledge, come to have ideas different from the vulgar and ordinary received ones, for which they must either make new words, or else use old ones

in a new signification; therefore it is sometimes necessary, for the ascertaining the signification of words, to declare their meaning, where either common use has left it uncertain and loose, or where the term, being material, is liable to doubtfulness or mistake, which may be done by synonyms, by exhibition, by definitions, by drawings, and by adhering to one signification.' These remedies, he continues, are necessary to the improvement of philosophy; and 'though the market and exchange must be left to their own ways of talking, and gossipings must not be robbed of their ancient privilege; though the schools and men of argument would, perhaps, take it amiss to have any thing offered to abate the length or lessen the number of their disputes; yet those who pretend seriously to search after or maintain truth, should think themselves obliged to study how they might deliver themselves without doubtfulness or equivocation.' 'For he that uses words without any clear and steady meaning, only leads himself and others into errors; and, if he does it designedly, he ought to be looked on as an enemy to truth and knowledge.' "

Perhaps the author's having hit upon our favourite topic, and even concluded with a strong expression in favour of accurate language, may have induced for him a sympathy which may betray us into some partiality. This we trust, however, will be a venial offence. The following are his remarks on nomenclature, and his rules of etymology.

"LAWS OF NOMENCLATURE, which no author is at liberty to supersede, and which it is the duty of critics to see enforced. These laws are scattered over the writings of various authors upon language, and I have endeavoured to collect those which were necessary to my purpose. Linnæus, in his different works, has laid down many rules, so excellent, that as soon as they were promulgated they were generally embraced, and the impulse which was given to natural history by his writings will make his name eternally dear to its votaries. In the nomenclature of inorganic substances, the proposals of the French chemists, Lavoisier and others, have met with great approbation. But the discoveries which have been the consequence of nomenclatural reform, have rendered some changes necessary.

"The language of science, unfortunately, is not calculated

to be the language of business; and from the length of the names of organic substances, and uncertainty of those of inorganic, neither have been generally adopted in pharmacy; nor has any one succeeded in giving commercial names that have been universally approved of. Notwithstanding this, much has been written upon the subject, but it has commonly been to point out a few errors, and not to establish the whole upon a grand and lasting foundation. Finding, in the nomenclature of the three British pharmacopœias, important differences in many names, such as chamomile, blistering fly, &c. I found myself obligated to give my reasons for selecting those which I have preferred; and the manner in which I have executed this task will, I hope, exempt me from censure, considering that it is the duty of authors to use those names which they feel to be the most proper and the most classical. In doing this I have proceeded with caution, and have arranged the names of species according to my view of their classicality and propriety, by which it will appear, that my proposed alterations extend only to names indubitably awkward, uncommercial, or unclassical. It is certainly desirable that the language of pharmacy should be classical; and there are those who, 'in defiance of all undue authority,' will ever oppose the depravity and barbarism into which we are at present plunged, and which must ultimately be extirpated, so that the taste of the last age will be succeeded by another less corrupt.

"**LAW I.** *When a name is once attached to a single species, it must not be given to another, except as an epithet. In other words, no name ought to be rendered equivocal, that is not so already.*

"**LAW II.** *When a name, usually considered as generic, is used specially, it must be understood as implying the original species, if it can be satisfactorily ascertained, and if not contrary to the generally-received opinion. It will also be necessary for the author who uses it in that sense to give some advertisement of it.*

"**LAW III.** *When a new species is introduced into commerce, it must have a new name of one word as pure as the Linnæan genera.*

"**LAW IV.** *Names must be as classical as possible, and it is*

the duty of an author to choose and to adopt from amongst the synonyms of a species the best name with which he is acquainted.

“RULES OF ETYMOLOGY. I. The character by which a species is distinguished, such as its resemblance to something else, its quality or property, its colour, its use, or its native situation when constant, suggest the most appropriate names, as *Pterocarpas*, *Chenopodium*, *Dulcamara*, *Glycirrhiza*, *Erythrodanum*, *Pyrophorus*, *Origanum*, *Cydonia*.

“2. New names must always be of the second quality if possible, but never so bad as the sixth. If of the first quality, they are destitute of euphony.

“3. Modern writers have taken the liberty of naming species from their discoverers, as *Spigelia* and *Quassia*; but such as *Geoffroya*, *Witherites*, *Swietenia*, *Kraschenninikofia*, &c. are, in my opinion, rather too incongruous.

“4. Names in point of orthography and etymology must not be contrary to analogy, as *Barytes* for *Barites*, *Ipecacuanha*, for *Ipecacuania*, &c.

“5. Names must not be too long nor inappropriate, as *Hypophyllocarpodendron*, *Spermaceti*, *Pulvis cretæ compositus cum opio*, for *Opium cretaceum compositum*.

“6. The solution of an inorganic or chemical substance, including oils, essences, soaps, camphor, and the like, in a menstruum, may either receive a name from both, that of the solvent being in the genitive case, as *Aqua calcis*, lime-water; or the solvent may give an epithet to the menstruum, for salt water or solution of salt is rendered into Latin by *Aqua salina* probably better than by *Aqua salis*.

“7. If we suppose that the common names of salts are of this description, the acids may very properly be called *Nitrate*, *Oxalate*, &c.

“8. All organic preparations are to be named in the same manner as inorganic, except *Decoctions*, *Infusions*, *Liquors*, *Elixirs*, and *Tinctures*.

“9. In Pharmacy, water impregnated with any air or gas may take the name of that air or gas, as *Murias*, &c.

“10. When two or more articles are dissolved in a menstruum, the basis must be in the genitive case, and the other

must give an epithet, as *Infusum sennæ tartarizatum*, *Tinctura cinchonæ composita*. And, when a name contains no epithet, it must be considered as simple: for instance, *Tinctura cardamomi*," &c.

A section on definition follows, replete with method and accuracy; some remarks on *Icons*, referring to the descriptions, and where they are to be met with, the plates of writers on natural history; Synonymy.

The second chapter is inscribed *Statics*, and comprehends a correct and classical view of weights and measures. This is particularly useful, on account of the facility and brevity with which the three *Pharmacopœias* are connected. Either, however, we have overlooked the passage, or the author has omitted the thermometrical degrees in speaking of the cubical measures of liquids. This may be thought of less consequence, as all the parts must be similar to the whole; but still there seems to us the want of a standard.

Classification next attracts our attention. The two first divisions are zoology and botany; the third chemistry. In the progress of the work, the author shows ample cause for this last division, and the various subdivisions into which it is formed. In zoology, he recommends Turton and Bingley as the most convenient, though not complete, writers on those subjects. In botany, Sir J. E. Smith and Galpine. We think he might have stopt here; but in the space of two or three pages, he attempts an analysis of the Linnæan system. This is enough to show how familiar the author is with the subject, but can hardly be expected to satisfy a tyro. Chemistry comprehends chemical numbers,—a very ingenious and not less perspicuous little abstract of which is given; chemical attraction, with an illustrative table; specific gravities [in this place the author has fixed the thermometric point;] pharmaceutic numbers, which, being connected with the index, we shall transcribe.

"In considering the proportion which the solvend bears to the menstruum, I constantly take the solvend for unity, and the number for the menstruum I affix to the preparation. Thus, in preparing Tincture of Squills, four ounces are added to a quart, or thirty-two ounces of proof spirit, which being

eight times as much, I annex the number eight to that preparation. Again, the Edinburgh college direct Unguentum Cerussæ to be prepared by mixing one part ceruse with five of simple ointment, the number attached to that article must be therefore five. Thus it is evident that this plan, while it supercedes simple formulas, answer, the purposes of the table appended to the Pharmacopœias. For, if we turn to opium, we shall find one grain united to as many grains of other substances as the number indicates.

“This invention may be applied to the construction of a

SYNOPTICAL PHARMACOPOEIA,

which, from its smallness, may very conveniently be suspended in a library, dispensary, or shop; for which purpose, two copies will be given with each one of this work. This table will very much assist the memory in retaining the composition of medicines, and I have myself found it of very extensive service for some time past.”

This division closes with a very useful contrivance for an easy reference to doses; and the chapter concludes with an explanation of the signs by which the authorities are marked in the different indexes.

The last chapter is on manipulation, and contains an useful little compendium. The materia medica follows, first alphabetically arranged, and afterwards remedially, in the manner of Dr. Cullen. The first of these is very copious, and requires a great deal of attention before it can be well understood. It is indeed connected with almost every other part of the book, both preceding and following it. When the reader has made himself master of it, he will find it extremely convenient on every occasion on which he wishes for information.

A list follows of those articles of materia medica which are usually imported, and of the places from which they are brought. Lastly a copious index and a synoptic pharmacopœia.

Such are the contents of a work, new in its kind, which must have cost the writer infinite trouble; and for which we, in common with the rest of his readers, are ready to acknowledge our obligations.

1. *Report together with the Minutes of Evidence, and an Appendix of Papers, from the Committee appointed to consider of Provision being made for the better Regulation of Madhouses in England.* Ordered by the House of Commons to be printed, 11th July, 1815. Each subject of Evidence arranged under its distinct Head, by J. B. Sharpe, Member of the Royal College of Surgeons, London.
2. *A Letter addressed to the Chairman of the Select Committee of the House of Commons, appointed to enquire into the State of Madhouses; to which is subjoined Remarks on the Nature, Causes, and Cure of Mental Derangement.* By Thomas Bakewell, Author of "A Domestic Guide in Cases of Insanity," and Keeper of Spring Vale Asylum, near Stone, Staffordshire.
3. *Practical Hints on the Construction and Economy of Pauper Lunatic Asylums.* Including Instructions to the Architects who offered Plans for the Wakefield Asylum, and a Sketch of the most approved Design. By Samuel Tuke.
4. *Observations on the Laws relating to Private Lunatic Asylums,* and particularly on a Bill for their alteration which passed the House of Commons in the year 1814.

[From the Eclectic Review, for March, 1816.]

AFTER a sanguinary conflict, especially when it has been of unusual and unexpected severity, as in the case of the victory of Waterloo, we hear with horror of numbers, who, although not the immediate victims of death on the field where they had fought and bled, nevertheless, subsequently lose their limbs and their lives for want of timely medicinal aid; and in consequence of that pressure and hurry in the business of healing, which directly succeed to the business of slaying. But the feelings which are excited by this consideration, must sink very low in comparison of those which are occasioned by the reflection, that mental soundness, and mental life, if we may so express it, are frequently lost for want of opportunity and of pecuniary resources, to preserve them. How many wretched beings do the wards of a public lunatic asylum en-

close, who, having been once as we are, are now reduced to a state of worse than brutal ferocity, uttering horrid blasphemies, and denouncing malignant menaces on all who pass by; but who, had their circumstances been such as to command the exercise of tenderness and skill equal to the exigencies of their cases, might now have been taking their places in the social circle formed by sympathy and affection, thinking, and feeling, and acting, like ourselves! In the great round of human misery and wo, there cannot surely be found any case that comes at all near to this in dreadful and heart-appalling interest.

That this statement is not a figment of the imagination, but a recital of facts, has been repeatedly asserted with all the confidence of conviction; and if such be the shocking state of things, in reference to lunatic hospitals, no wonder that, in this age of reformation and of public spirit, the attention of the legislature should have been called to the consideration of this momentous inquiry—‘Whether the circumstances and treatment of lunacy are susceptible of melioration and amendment.’

This question has indeed been recently agitated in the British Senate, with an earnestness and interest which will command the admiration of posterity.

“The labours of Mr. Rose and his associates,” (as is well observed in one of the pamphlets before us) “were labours of simple humanity and benevolence unmixed with party feeling, and of too partial an influence to produce them fame: while the unhappy objects of their compassion are shut out, perhaps for ever, from the world, and generally unable to express or even to feel gratitude. May they live (adds the writer) to receive the only reward they appear to aim at or desire, in the certainty that their completed deliberations and exertions have removed all the evils which occasioned them.”

Before we proceed to a more detailed account of this investigation and its results, we shall say a few words on the recently much agitated inquiry, which immediately and obviously arises out of the preceding one, and which was repeatedly urged by the members of the committee of investigation in the course of their individual examinations. It is this—Whether is in-

sanity under the control of remedial agents, in the same manner as those maladies which are more properly and strictly regarded as affections of the bodily frame? Is madness to be cured by medicine? The remarkable discrepancy which was displayed before the committee, in reference to this very important question, must have necessarily excited some degree of scepticism, or at least of uncertainty, in the minds of those who entered upon the inquiry with anxious but unprejudiced minds. We are told by one person, a man of unquestioned talents and extensive experience, that he considers vomiting rather injurious than beneficial in cases of insanity; another, of equal experience, and of great name, stated his dependence upon the medicinal power of emetics; and in this opinion he is countenanced by a recent writer of great merit, on the subject of mental affections. One physician, who has directed his knowledge and attention principally to these unhappy affections, approves generally of venesection; a second, similarly circumstanced, describes this practice as fraught with extreme danger. Purgatives are the sole dependence of some, alteratives and tonics of others. This practitioner prescribes *warm*, that, *cold-bathing*. Some say little is to be done by *any* curative means; others, with even greater confidence, assert that *insanity is the most remedial of all the maladies to which man is heir*.

The fact is, we believe, that a great deal of this diversity of sentiment and opinion, has arisen in consequence of regarding the subject in too empirical a manner. Medical men talk of curing lunacy, as the vulgar speak of curing a cough. Indeed, while a generic term is made to include so many varieties, in relation to the causes upon which derangement depends, it cannot in strict propriety be made a question, whether insanity is, or is not curable. When a man receives a sabre wound on his skull, and consequently loses his senses, we are in the habit of considering the case without cure, from a general feeling, founded upon obvious truth, that as an organic lesion has here been the occasion of the deranged state of the intellect, it cannot be set to rights, because it is not within the compass of medicine or management to *re-organize*. Again, if part of the brain is annihilated by accident or disease, we cannot re-

store the lost *material*, nor by consequence its particular functions; or if a tumour grow in the interior of the encephalon, the derangement of functions to which it gives rise, is irremediable, inasmuch as the cause of the derangement is itself untangible. Now, our knowledge of sentient and intellectual faculties, as connected with structure, is so extremely limited; the knife of the anatomist does so very little in clearing away the obscurities which hang over sentient organization, that we may conceive of alterations quite as effective, and quite as permanent, as those just supposed, although they may not, even by any artificial means, be capable of being detected by our senses; and, in that case, the mental malady might be quite as hopeless, in respect to any prospect of recovery, as in instances where it has been dependent upon such palpable causes, as obviously to place it out of the possibility of cure. Disordered intellect, therefore, having in its display to do with the sentient system, of which our knowledge is so confined, cannot be calculated upon, either in respect to its essential nature, or any probability of advantage to be derived from treatment, with any thing like the accuracy with which we predicate the remedial nature or fatal tendency of mere bodily ailment.

Although it is not within the scope or intention of the present paper, to pursue the subject of insanity in the way of regular dissertation, we shall, we trust, be excused for adverting to one particular feature in the phenomena of deranged intellect, which we conceive has not been sufficiently recognized or dwelt upon, in investigations relative to the *rationale* of mental alienations. We allude to the alternate, and, as it were *vicarious* manner, in which diseases of the body and of the mind oftentimes succeed to, and take place of each other. In a pamphlet which Mr. Tuke some time since published, there is one remarkable example of this kind, which, from its very interesting nature, deserves recital.

“A young woman, who was employed as a domestic servant by the father of the relater when he was a boy, became insane, and at length sunk into a state of perfect idiocy. In this condition she remained for many years, when she was attacked by a typhus fever, and my friend, having then practised for

some time, attended her. He was surprised to observe, as the fever advanced, a development of the mental powers. *During that period of the fever when others were delirious, this patient was entirely rational.* She recognised, in the face of her medical attendant, the son of her old master, whom she had known so many years before; and she related many circumstances respecting his family, and others, which had happened to herself in her earlier days. But alas! it was only the gleam of reason; as the fever abated, clouds again enveloped her mind. She sunk into her former deplorable state, and remained in it till her death, which happened a few years afterwards."

Although this case must be considered as very extraordinary, the records of medicine are not wanting in instances of that kind of succession and alternation of mental and bodily disorder to which we have above referred, and of which the example just narrated is but a remarkable and forcible illustration. Dropsical and pulmonary affections have been seen to yield, in order to make way, in a manner, for the introduction of insanity; while this last has been expelled, in its turn, by the super-vention and return of the original complaint. There is another circumstance, also, which is common to mental alienations, and which, indeed, is of so frequent occurrence, as to have been often noticed by many persons who were not professional observers; we allude to that sudden and transient restoration of the intellectual faculties, which not unfrequently immediately precedes bodily dissolution. After the mind has, to all appearance, been for years extinct, it bursts out from its corporal confinement, and casts a parting glance at the surrounding scene.

These facts demonstrate a frequent connexion between ailments of the body, and of the mind, as intimate as it is inscrutable; and serve to show that the human frame may be subject to such varieties of condition as to be productive of mental hallucination, although the precise nature of such state shall elude every research of the pathologist. As we are ignorant, then, of the nature, we must also be ignorant of the extent and probable duration of the morbid change. When, therefore, we find, as in some of the publications before us, individuals asserting with confidence the curable nature of insanity, and hinting,

that had this and that patient been under their care, the hallucinations would have disappeared, we cannot avoid regarding their assertions and intimations, as partaking in a large measure of empirical presumption. Which among them could have anticipated the circumstances and temporary cure of the idiotic girl above referred to? and who is there that could unravel the intricacies of the case by any ascertained physiological principle?

But there is another consideration, and it is one of a very momentous and imperative nature, which has still more to do with the late investigation; it is this—whether, even in cases of incurable lunacy, it be not possible to effect by conciliation and kindness, what has hitherto been often essayed to be done by coercion and restraint?—Is a madman out of the pale of humanity?—Is he, on account of the suspension of reason, to be treated as if the rational faculty were not obscured, but extinct? To these most important queries such replies have been made as to implicate, in their tendency, the conduct and character of several receptacles for the insane; it appeared, therefore to be the duty of an enlightened legislature to interfere further in behalf of this most afflicted portion of the human race. That interference, as we have above observed, has been candidly, rationally, and humanely made, and the publications before us are some of its consequences.

The legislature has had, however, a still further object in view, than that of securing an appropriate treatment, and as much comfort as is consistent with their situations, to those who are already and properly confined in consequence of mental disorder. Its aim has been directed towards placing a more effectual barrier, than the act already in force has been found to provide, against the commission of the enormous crime of unnecessary confinement; a crime which, to the eternal disgrace of human nature, has not only been in many instances conceived, but actually committed.

We shall not detain our readers with any very copious extracts from the published reports of the committee of investigation, especially as they have already been before the public in the prints of the day. We shall therefore confine ourselves to the selection of one or two examinations, which will serve to

show to those who may not hitherto have had their attention drawn to the subject, the great good that has already been effected by the business having been brought before the consideration of Parliament. The honourable Henry Grey Bennet, himself a member of the committee, presents to it the following evidence:—

“I visited Bethlem some years ago, and was then very much struck with the condition in which the patients were; there appeared to me to be the greatest coercion in general use; numbers were confined to the wall, fastened to benches and tables, and many of the patients were almost in a state of nudity: I visited it again last year in company with Mr. Wakefield, Mr. Lambton, and one or two other gentlemen; I found not so many patients in the same state of nakedness and restraint as at my last visit, but, in the women’s wards up stairs, there were many of those unfortunate people chained to the wall in a small room, some of whom had been so chained for years during the day; the smell and dirt of the room were in the highest degree offensive; *amongst those persons was a woman of the name of Stone, who was formerly a governess in a respectable family, evidently a person of some accomplishments, who was chained to the wall, though she did not appear to be at that time or was stated ever to have been a furious maniac.* There was also a woman confined in a cell, chained to the wall at the end of the gallery; she had been so confined for several years, was in a state of furious agitation, and her voice and cries could be heard in all that part of the hospital. I saw also Norris; the iron apparatus in which he had been confined was then removed; but the chains which fastened the neck of the patient to the iron stanchion as well as the leg-lock, were still used.

“Norris stated, that he was fully aware he was a dangerous person; that he should be sorry to be permitted to walk unmanacled in the gallery; but if he could be prevented from doing others any mischief, which, if he was not provoked he should not attempt to do, he should consider the permission of taking that exercise a great indulgence; he added also, that he had made repeated complaints against the mode of confinement in which he had been for so many years; *but that he was*

now treated like a Christian, and that he felt himself quite comfortable. He particularly alluded to the pleasure he felt in being able to sit down on the edge of his bed; he was employed in reading the newspaper, and he asked me many questions on the subject of politics, in which he appeared to take the greatest interest. I visited Bethlem, on the 27th of May last, in company with other members of the House of Commons, Lord Lascelles, Mr. William Smith, Mr. Duncombe, Mr. Frankland Lewis, and Mr. Sturges Bourne. *The change that had taken place in the appearance of the patients in the Hospital was most striking; on the men's side, no man was chained to the wall; only one was in bed, and he was ill; the patients were mostly walking about in the gallery, and the whole hospital was clean and sweet. On the women's side, two only, when we entered the hospital, were chained by the hand. Miss Stone, who had been confined in the hospital for several years, three of which she had been chained during day-time to the wall, wrapped up in a flannel gown, was sitting by the fire dressed like a woman, employed in needle-work, and tolerably rational; she appeared cheerful, and contented, and most grateful to the matron, who accompanied us during our visit, for the change which had taken place in her situation."*

"The woman who was confined at the end of the gallery the year before, in that violent state of irritation above mentioned, was now released, and was walking about the gallery, apparently tranquil; she repeatedly thanked the matron for her kindness, and said it was owing to that kindness that she was in the composed and comfortable state in which we found her. I have no doubt that the change which is so visible in the condition of the hospital, and in the mental improvement of the patients, has arisen from the different treatment that they have received from the new steward, Mr. Wallet, and the new matron, Mrs. Forbes. To any one who remembered the apparent neglect with which, the preceding year, these unfortunate persons were treated, this change in their condition was most consolatory."

In answer to a further question from the committee, whether he did not consider the iron apparatus worn by Norris to be unnecessarily heavy, Mr. Bennet replies,

"From what I have seen of furious maniacs in other hos-

pitals and places of confinement, I should have no hesitation in saying that it was a mode of restraint unnecessary and unwarranted. It has always appeared to me (he adds) from what I have seen of Bethlem, that the restraint was used there more from feelings of revenge than for purposes of medical cure."

The above evidence is a document of too unequivocal a nature, which establishes the fact that much abuse has existed; it serves at the same time to prove, beyond the possibility of dispute, that much may be done, with safety to the attendant and advantage to the patient, by kindness and conciliatory treatment. The only remaining inquiries then, at issue, are, by what means this treatment can be best secured to the unhappy sufferers under mental derangement; and what are the best measures to which the legislature can have recourse in order to prevent the practice of confining individuals upon groundless and false pretences.

It was a natural order of proceeding, in reference to the first-particular, to establish an inquisition into the condition and usages of those several receptacles for the insane, that were already in existence; and by collating and contrasting their respective advantages and disadvantages, to come to such conclusions as should serve for a guide to future proceedings. Accordingly, the printed reports exhibit the interior of a great number of lunatic asylums, in some of which, as in the larger and more public establishments, were unveiled the most shocking mismanagement and the most culpable neglect. It is, however, gratifying to learn, from the accounts of others, that a conscientious skill and persevering humanity, were employed to effect one of the most momentous objects that can engage the energies of man. An account of a well-regulated establishment, called the Retreat, near York, instituted and conducted by the Society of Friends, has already been published, and our readers will hear with great satisfaction that this asylum has many rivals both in exterior and internal advantages.

Those institutions appear to be the most effectual in promoting the well-being of their inmates, in which attention is given to the following particulars. A due separation and classification of the patients according to their sex, their circum-

stances in life, and the degree of derangement to which they are subject; kindness joined with firmness on the part of the superintendents, with an endeavour, on the part of the superior officers, to excite the esteem and affection of the unhappy individuals over whom they are placed; such a construction of houses, as will ensure sufficient proximity of keepers and patients, and at the same time afford room enough for the latter, these apartments being as free from gloom and prison-like appearance, as is consistent with the nature of the establishment; ventilation without an undue exposure to the inclemencies of the weather; light, nourishing, and wholesome diet, to be regulated according to circumstances, both in respect to quantity and quality; cleanliness both in act and in habit; and lastly, a judicious regulation of mental and bodily exercise.

For the purpose of showing the very great good that may be done by a well regulated system of occupation, we shall be easily excused for transcribing the following extract from the examination of Mr. Finch, the keeper of an excellently planned and well conducted asylum at Laverstock, near Salisbury. The Committee ask this gentleman, whether the patients under his care are accustomed to take much exercise. In reply, he says,

‘A great deal of exercise; I think it necessary to health; I was led to this remark by observing a few years ago that my pauper patients recovered in a greater number than those in a better situation in life, which I attributed to their being employed in my garden, in working, digging, &c.’

“Is it your opinion,” the Committee go on to say, “that the employment of the body contributes in a great degree to the restoration of the health of the mind?” “It is.”

“Is it your practice to allow patients of all descriptions, the more opulent as well as the paupers, to work and employ themselves in your garden?” “I allow them to work if they should be so inclined; but as I could not enforce that upon my superior patients, whose habits of life are not congenial with it, I substituted amusements to supply its place; such as bowling-greens, cricket, billiards, and all the different amusements which act upon the mind and keep the body in exercise; and

then I found a corresponding good attend the superior patient as well as the others."

" "Have you any doubt that the practice which has been so successful in your own establishment, might be as successfully adopted throughout the different public establishments?" "That is my idea; I do think so; I think they cannot be perfect without it; I can give a very strong case of a patient I had from St. Luke's; he was a man of opulence, sent there as a pauper, (and of course some other precluded from the advantages of the Institution,) he came to me afterwards as a gentleman with no increase of property: this man came to me a most miserable object from St. Luke's, after having been a twelvemonth, and discharged as incurable; he walked upon his toes; he could scarcely get from the coach to my house; the muscles of the legs were contracted; he was exceedingly nasty, and he would have eaten his own flesh had he not been prevented; he tore it immediately as he came to me; I tried to put him into a room where he could do no mischief to himself or any one else, *but took off every restraint*; I found him within a few days somewhat more composed; some little time afterwards he became so bad again with respect to filth, that I was obliged to use some restraint, and have a man constantly to watch him; by attending to his bowels, and keeping him strongly exercised in the garden and in the fields, I found him gaining strength daily; within six weeks capable of playing bowls; and I sent him home perfectly restored in four months, where he carried on the business of a coach proprietor three years afterwards, and called upon me many times in his gig, and thanked me for my attention to him."

How melancholy to reflect that the poor clergyman described in the minutes of evidence on the York Asylum, was not placed under the care of Mr. Finch, or in an asylum of similar treatment; he would then probably have been restored to the blessings of intelligence and of life. Probably, we say, for we still protest against that *empirical dogmatism* which would pronounce an absolute *à priori* opinion on any case of mental malady.

But we hasten to give our readers a concise account of the remaining pamphlets whose title-pages are at the head of

this article. It is the design of the last of these to discuss the subject of legislative enactments, for the prevention and remedying of alleged and allowed abuses in lunatic establishments.

The practical hints of Mr. Tuke need not detain us long. The tract is sensible, and well written, and worthy the attention of those persons who are contemplating the erection or the alteration of houses for the insane.

“The defects, (Mr. Tuke says,) in the construction of asylums which I have had opportunity to observe, have defeated one or other of the following objects, which appear to be of primary importance to the welfare and comfort of lunatics. 1st, The complete separation of male and female patients. 2nd, The separation of patients in proper number and distinct apartments, according to the state of their minds. 3d, A system of easy and constant superintendence over the patients, by their attendants, and over both by their superior officers. 4th, That the accommodation for the patients should be cheerful, and afford as much opportunity for voluntary change of place and variety of scene, as is compatible with security.”

These several heads the author enlarges and dwells upon with no small degree of characteristic simplicity and unaffected good sense. He proposes the following system of classification.

“1st class, Those who are disposed to incoherent laughing and singing; and generally all those who are capable of very little rational enjoyment. 2d class, To consist of those who are capable of a considerable degree of rational enjoyment. In this class most of the melancholics and hypochondriacs will be included. Several of this class will be able to assist in the house or be engaged in some useful labour. 3d class, The convalescents, and those patients whose derangement leaves them fully capable of common enjoyment. A few of the best melancholics should also be admitted into this class.”—We shall only add to our quotations from this tract the following important remarks.—“The worst patients require most attention, and are most likely to irritate their attendants. A distinct or very remote building, exposes them to all the evils of neglect and abuse, and there is, generally speaking, more to fear for

than *from* them. The evils of *noise* are not so great as those of *filth*, *starvation*, and *cruelty*. I have no doubt, however, that it is possible so to construct rooms as to avoid the annoyance of the *many*, and the injury of the *few*."

The 'letter' of Mr. Bakewell is not without its merits, but his style and manner are too much tinctured with a sort of self-sufficiency and seemingly disappointed expectations. He proposes the establishment of 'National Hospitals for the cure of insanity alone; to admit none but recent cases, and to keep them only for a limited time;' the masters and servants to have liberal fees for every recovery, which fees should be 'entirely lost in cases of failure.' We should for ourselves apprehend, that this 'no cure no pay' system, would go far to exclude individuals of liberal education and enlightened minds, from undertaking the task of superintendence; and we feel quite sure that the poor sufferers would have so much less chance of benefit from medicine and management, as these qualifications should be wanting in the keepers of Mad-houses.

It will not be worth while to follow Mr. Bakewell through his reasonings on the nature and essentials of insanity; we shall merely observe, that his practice appears, to say the least of it, quite as good as his theory; and, if we may trust to the correctness of his statements, his treatment is, on the whole, singularly successful. At the end of the pamphlet are several interesting, and somewhat instructive cases; the last of which, with his own remarks upon it, we shall lay before our readers. 'In the early part of a morning, before daylight, I was awoken by a loud knocking at the door; and upon going to the window, I saw by the light of the moon, a man upon his knees in a very loud prayer that the Lord Jesus would send down his grace upon the master of that house and all his family. Convinced from his manner that he was mad, and conceiving that a Madhouse was the fittest place for him, I called to say that I would let him in. On his entrance he was for a time very collected, and gave me his relation as follows; "I have been from home several weeks; I have been to attend the last illness and death of my poor father; he left some little property behind him, and we had some very unpleasant disputes; I

have, too, drunk hard, and the people said I was going mad; but bless the Lord, they were mistaken, for I was never so well in my life as now. Coming home upon one of the coaches, a voice came to me, and bid me go forth and preach the gospel of the Lord Jesus; I began to pray, and I got off at the village below, and have been praying for the dear souls of the people." "How came you up here?" I said. "Why the Lord Jesus directed me here, to be sure." "What! have you been some time with the Methodists, for I presume you are one?" "No, I never was with them in my life; I do not so much as know any Methodists; but if it please the Lord Jesus, I mean to join that holy people this very day; I shall find some of the preachers at Stone. In the strength of the Lord, I can do any thing: I can strike my arm through that fire; and I can strike my arm through your body." In about two minutes after this, his arms were properly secured in a straight waistcoat; on first seeing of which he expressed a wish to have it on, in order to convince us that the Lord Jesus would break his bonds asunder; and as soon as it was properly secured, he cried out—"Come, Lord Jesus, break my bonds asunder," accompanied with all the efforts in his power; but these not succeeding, he became calm again for a while. For two days, he was the most part visionary; but using all my efforts to remove his complaint, he seemed quite recovered on the fourth day, and appeared in his own natural character, viz. that of a bold profligate, with no more religion than the bird that bears his name (Swan.) I wish he *had been* a Methodist; for in that case I should have hope, that he would some time find grace enough to pay me my charge; but as it is, I have no hopes. I have often asserted that the visionary fervours of devotion, which have been stated as the *cause* of insanity, were frequently the first *effects* of it, and this is an instance. A contemporary writer on insanity, goes a little out of his way to stigmatize the Methodists as the frequent cause of insanity; and in walking with him through his own Hospital, which contained at that time about a hundred and fifty patients, he pointed out *two old women*, who were, he said, Methodists."

On this we shall leave the reader to make his own comments; and shall now dismiss the consideration of Mr. Bake-

well's tract, by merely remarking, that we think some credit is due to him for his courage in crying down the common cant—for *cant* it is—that religion is so much the occasion of madness.

The last in the list of the pamphlets under notice, is penned by no common hand. It contains in the first place a general sketch of the act of the 14th of his present Majesty, intituled, "an act for regulating Madhouses;" which is followed by an outline of the "Bill to repeal that act, and for making other provisions in lieu thereof," which passed through the House of Commons in the year 1814. The objections of the writer to this last bill are made against that part of it, in which it principally differs from the previous one, viz. to the mode of granting licenses, and the powers given to the visitors. We do not perceive the validity of his objections respecting the application of new laws to establishments already existing, for such an enforcement would not, as in the case of apothecaries and attorneys, deprive the individuals to whom they should apply, of their means of sustenance; and, it should be recollected, that one of the prime objects which the framers of the new bill had in view, was to correct *already existing* abuses in lunatic establishments.

Nor does it appear to us, that the person to be licensed must be so hardly dealt with by the discretionary powers being vested in the hands of the commissioners; for, independently of the circumstance of such commissioners being chosen from a liberal and respectable class of men, there would be very little apprehensions of sinister motives guiding their decision; inasmuch as the refusal of a license, or impediments of any kind to the present licentiate's views and wishes, would not be the act merely of one individual. It would appear, however, as far as relates to the laws of visiting, to be a greater safeguard to the rights of the masters of houses, were the visiting magistrates in the county districts required to be at least four instead of two in number; and it would be, perhaps, expedient, that two of these four should be selected from gentlemen resident in a part of the county distant from that in which the establishment existed; as too much care cannot be used to prevent the operation of local prejudices and

party interests. It is to be recollected that both Commissioners and visitors, in case of their decisions being inconsistent with justice, are liable to be convicted of improper conduct, by the act giving to the aggrieved person a power of appeal.

With respect to the right of removal being in the hands of the visitors, we think, upon the whole, that this is calculated to have a salutary effect as an *in terrorem* preventive of abuses; and it is not likely that the censors in question would very readily take upon themselves the heavy responsibility of ordering the liberation of any individual, unless the proofs of sanity were of too marked a character to admit of indecision or doubt.

That clause in the Act, which requires the visitors of asylums to direct that one or more accessible pumps be placed in certain parts of the premises, we think liable to all the objections which the author brings against it. We think too, that this charge of injustice is valid against that clause of the bill relating to payments of licenses for a part of the year, however small. But our limits prevent us from pursuing the subject further, and we shall now bring the discussion to a close, by again stating, in a very few words, our general sentiments respecting the treatment of insanity, and on what has been already, and ought further to be done, towards meliorating the condition of the unhappy subjects of mental derangement.

It will have been gathered from what has been advanced in the course of these pages, that our dependance on medicine, merely, is exceedingly small. There is a want of *tangible decision*, if we may so express it, in the pathology of lunacy; and its treatment must, by consequence, be, at present at least, in a great measure empirical. If any medicinal agents deserve to be preferred to others in affections of the mind, they are, perhaps, purgatives, regularly and perseveringly administered, and the warm-bath. Our few short extracts afford sufficient evidence of what is to be done by air, exercise, cleanliness, classification of patients, duly regulated bodily and mental occupation, and lastly, assiduous endeavours on the part of the superintendents to excite new trains of thought, and new habits and associations. It will have been remarked, that in

those establishments in which the above advantages were insured to the sufferers by the skill and humanity of the keepers, good was in the same proportion invariably effected.

In regard to legislative enactment, we really think that Mr. Rose's bill, a little modified, might effect all that is desirable to be done. There is, however, in our judgment, a loud call for County Establishments. These ought not to be optional, but compulsory, and each county should bear its own expenditure. The erections ought not to be suffered, until a plan of the building, its situation, and dimensions, shall have been presented to, and approved of by the commissioners of lunatic asylums. These buildings, when erected and occupied, should be subjected to precisely the same regulations and restrictions as the private asylums; and it would of course be desirable to avoid every expense that is not necessary to the comfort and well-being of the inmates of the respective houses. We may in conclusion express our belief, that a certain degree of reform must be the consequence of the investigation that has been excited, and of the regulations that are proposed; and although experience teaches us, in cases of this kind not to expect perfection, yet we feel convinced that much and lasting good will be conferred upon the community, by the recent labours of the House of Commons to improve the condition of Madhouses in England.

BIOGRAPHICAL NOTICE.

DIED, at his house in Sambrook-court, after a few days illness, aged 71, JOHN COAKLEY LETTSOM, M. D. F. R. S. &c. one of the ornaments of the age, a useful benefactor of mankind, a philanthropist in the truest sense of the word, and a man whose like the world will seldom witness. He was born in a small island near Tortola, about three miles in circumference, called Little Van Dyke, in the year 1744: his ancestors, on the father's side, originated from Letsom, or, as it is called in Doomsday-book, Ledsom, a small village in Cheshire: on the mother's side they are lineally descended from Sir Cæsar Coakley, an Irish baronet, whose family have uniformly possessed a seat in the parliament of that kingdom, the last of whom was Sir Vesey Coakley. When about six years of age he was sent to England for his education. His future destiny was determined by the accidental circumstance of his landing at a sea-port, where Mr. Samuel Fothergill, a celebrated preacher among the quakers, and own brother to the late distinguished physician of the same name, happened to be on a visit; and he was received into the very same house in which the preacher lodged. After leaving Dr. Sutcliff, he came to town, and assiduously attended St. Thomas's Hospital for two years; he then went back to his native soil, to take possession of a property which came to him by the death of his father, and elder brother, who, having contrived to run through an ample fortune, in a few years, left very little of the family estate to be inherited by the Doctor, except a number of negro slaves, whom, to his honour, he emancipated; and, in the twenty-third year of his age, as he has often told the writer of this article, found himself five hundred pounds worse than nothing. The fortune of Mr. Lettsom was henceforth, therefore, solely to be made as a medical practitioner; and, as difficulty begets exertion, so strenuous were his endeavours, and so extensive was his practice in Tortola, where he settled, that in a very short time, he was enabled to return to Europe, and to visit

the great medical schools of Paris, Edinburgh, and Leyden; at the latter of which universities he took his degree. To complete his education, he visited, besides Paris, most of the places of resort for the relief of invalids abroad; as Spa, in Westphalia, Aix-la-Chapelle, and various others. When he visited Paris, he carried, among other honourable recommendations, the following one from Dr. Franklin to Monsieur Dubourg.

Londres, 30 Août, 1760.

“ * * * * * Cette lettre vous sera remise par le Docteur Lettsom, jeune médecin, amériquin de beaucoup de mérite, qui est de la paisible secte des Trembleurs, et que vous regarderiez conséquemment au moins comme une rareté à contempler, quand même vous auriez épousé toutes les préventions de la plûpart de vos compatriotes sur le compte de ces bonnes gens.”—(Œuvres de Franklin, tom. ii. p. 314. Paris, 1773. He was afterwards introduced to the celebrated Macquer, Le Roy, and other characters conspicuous at that period, and with whom he corresponded till their decease. He published the life of his friend Dubourg, in the first volume of the Memoirs of the Medical Society of London. After this circuit, he repaired to London, where he finally settled, with the undeviating friendship of his old guardian, and the patronage of his brother, the physician, whose life he has lived to publish to evince his gratitude. About the year 1769, he was admitted a member of the Royal College of Physicians; the year after, he was elected a fellow of the Society of Antiquaries; and in the year succeeding that, a fellow of the Royal Society. Amongst the most remarkable *public* services that Doctor Lettsom has rendered his country, was his contest *with*, and complete conquest *of*, the most famous of all the most famous water-doctors, the redoubted Mayersbach. Doctor Lettsom's writings are very numerous, as well moral as medical, and all of them discover the philanthropist and physician; the whole on the basis of public good. We are pleased with the opportunity of presenting a more accurate list of them than has yet been given:—

1. Reflections on the general Treatment and Cure of Fevers, 8vo. 1772. 2s.

2. *The Natural History of the Tea-tree, with Observations on the Medical Qualities of Tea, and Effects of Tea-drinking.* 4to. 1772. 4s.

3. *The Naturalist and Traveller's Companion; containing instructions for collecting and preserving objects of natural history,* 8vo. 1774. The second edition, 2s. 6d. The third edition, 1800. 4s.

4. *Medical Memoirs of the General Dispensary in London.* 8vo. 1774. 4s.

5. *Improvement of Medicine in London, on the Basis of Public Good.* 8vo. 1775. 1s. 6d.

6. *Observations preparatory to the use of Dr. Mayersbach's Medicines,* 8vo. 1776. The second edition, with an engraving of the Water-Doctor from Teniers. 1s. 6d.

7. *History of the Origin of Medicine; and of the State of Physic prior to the Trojan War. An Oration delivered before the Medical Society of London,* 4to. 1778. 6s.

8. *Observations on the plan proposed for establishing a Dispensary and Medical Society, with Formulæ Medicamentorum Pauperibus præcipue accommodatæ.* 8vo. 1772. 1s.

9. *A Letter to Sir Robert Barker, Knt. F. R. S. and George Stacpoole, Esq. upon General Inoculation,* 4to. 1779. 6d.

10. *Hints, designed to promote Beneficence, Temperance, and Medical Science,* 8vo. 1798. 5s.

11. *Observations on Religious Persecution,* 8vo. 1800. 6d.

12. *Village Society, a sketch,* 8vo. 1s.

13. *The Works of John Fothergill, M. D.* 3 vols. 8vo. and one volume 4to. 1784. 1l. 1s.

14. *Memoirs of the Life of John Fothergill, M. D.* 8vo. 6s.

15. *Hints addressed to Card Parties,* 8vo. 1779. 6d.

16. *Observations on Human Dissections,* 8vo. 1788. 1s.

17. *Observations on the Cowpock, two editions,* 1801. 8vo.

18. *Hints on Beneficence, Temperance, and Medical Science,* 3 vols. 8vo. 1801.

Besides various Medical Essays, &c. in the Philosophical Transactions—Memoirs of the Medical Society of London—Bath Society Memoirs, &c. &c.—In person Dr. Lettsom was tall, and always of a spare habit. There was not any of the graces in his manner or features; but there were a great

many of what is much better than any merely personal advantages have to bestow—the *benevolences* of a worthy heart, and the marks of a good understanding.—Dr. Edmund Fry has obligingly communicated to us the following particulars, and the originating cause of the death of this great and good man. “On Wednesday, Oct. 25, Dr. Lettsom was at my house, and I could not but observe that he seemed much indisposed; he informed me, that, on the preceding evening, he had been requested to be present at a dissection, to give his opinion on any morbid appearances that might arise; he was there detained about three hours with the cold body, in a very cold place, without any fire, or extra clothing; that he had, during the night, suffered, in consequence, a severe shivering for a long time. The succeeding night he had fever about six hours, of which he informed us when we saw him the next day; he was then evidently much worse, and so enfeebled, that with difficulty he walked up one pair of stairs. On the afternoon of this day I called to see him, but he being engaged with his daughter, I declined the invitation into the parlour; soon afterwards, he was first visited by Dr. Babington and his friend Wm. Norris, esq. the surgeon: his complaint was rheumatic, with some degree of fever, which seemed to indicate a need for the lancet; but, on preparing for the operation, a forbidding erysipelatous inflammation presented itself. His medical friends were unremitting in their attendance, but were very soon induced to think his case nearly hopeless: and, about the third day of his illness, the doctor himself intimated a doubt of his recovery: but it does not seem that he afterwards mentioned the subject. He expired about half past four on Wednesday morning, perfectly sensible to the last, and free from pain. Having of late years been much favoured with his friendship, I was one of the last of his friends who had an opportunity of conversing with him. At a late interview, he informed me, that, relative to the so-much-talked-of addition to his income, the pleadings before the Lord Chancellor were all concluded, and that his lordship was to give his decree on the matter this Term, when he should be put into possession of an independence, far beyond his wishes; but that the amount had been greatly exaggerated in the public papers. It gives me very

great pleasure just to add, that, the very last time I saw him, he mentioned the circumstance of his emancipating a number of slaves when he was young, and what happiness he should feel, should he live to do the same for those in his newly-acquired possessions."

Monthly Magazine, for December, 1815.

Biography of the late Dr. Denman.

[From the London Medical and Physical Journal, for January, 1816.]

DR. THOMAS DENMAN was born on the 27th of June, 1733, at Bakewell, in the county of Derby, and was the second son of a respectable apothecary in that town, where he was educated at the grammar school. His father died in the year 1752, and he for some time assisted his elder brother, who succeeded to the business; but in his 21st year he came, with the slender patrimony of 75*l.*, to London, where he attended St. George's Hospital several months, and two courses of lectures on anatomy. He then procured an appointment as surgeon's mate in the navy, and being made surgeon in 1757, through the interest of the Duchess Dowager of Devonshire, he, after a cruise of seventeen months off the coast of Africa, was appointed to the *Edgar*, a new 60-gun ship commanded by Captain, afterwards Admiral, Drake, with whom he continued, till, on the conclusion of peace in 1763, he left the navy. During his nine years' service, he formed many valuable friendships, which he preserved through life, particularly with the amiable and excellent officer whose name has been mentioned: his mind was enlarged by general reading, and by visiting various parts of the world; and, having been present at most of the important naval operations of that war, he materially improved his medical skill and knowledge. At the siege of the Havannah (as on a former occasion, when he assisted in the hospital at Gibraltar, then containing no less than 1100 patients), he contracted a dangerous illness, from too close an attendance on the sick and wounded. On returning to his na-

tive country, he continued, as before, to pursue his professional studies in London, and attended the Lectures on Midwifery then given by Dr. Smellie; but, obtaining, in 1764, a diploma from the University of Aberdeen, he endeavoured to establish himself at Winchester. This attempt proving unsuccessful, he again took up his residence in the metropolis, where his prospects were so little flattering, that he actually made an effort to resume the situation of a surgeon in the navy, but was unable to procure a warrant. Under these circumstances, the surgeoncy of one of the royal yachts, which he owed to the influence of Lord John Cavendish, and the friendly recommendation of Captain Drake, which brought a salary of 70*l.* a year, without materially affecting his London practice, afforded an important addition to his small income. About the same period he became more generally known by the publication of some medical tracts, and commenced those Lectures in Midwifery, in conjunction with the late Dr. Osborne, which they continued to deliver for fifteen years with great reputation. In the same year he was appointed joint physician and man-midwife to the Middlesex Hospital. With these aids, and by a rare union of patience, industry, and frugality, with an ardent temper, an independent spirit, an honest ambition, and singular zeal in his profession, he was enabled to emerge, by slow degrees, from obscurity to the extensive practice and eminent character which he so long enjoyed. He was appointed licentiate in midwifery by the College of Physicians in 1783, and six years after was elected an honorary member of the Edinburgh Royal Society. Dr. Denman's progress towards the first practice was, however, the more slow, because Dr. Hunter had long been in possession of the public confidence, and because Dr. Ford was at the same time in extensive business. But, when he had reached the summit of his branch of the profession, Dr. Denman kept his station with a firmness of which there have been few examples. This arose from his full and well grounded knowledge, from his strong natural sagacity, from the most perfect uprightness of conduct, and from the benevolence of his character. In 1791, Dr. Denman purchased a small country-house at Feltham, near Hounslow, and in some measure withdrew from business; but he

never quitted it entirely, and to the latest period of his life, preserving the unabated confidence of the public, he may be truly said to have possessed that of the members of his own profession even in a greater degree. At the very advanced period to which he lived, he retained, to a wonderful extent, the vigour of his body, and, quite unimpaired, the vigour of his mind; but what is still more singular, he retained also, without decay, all the kindly affections of his nature, with all the cheerful animation of youth, and exercised an active benevolence to the very last.

In the year 1770, Dr. Denman married Elizabeth, the youngest daughter of Alexander Brodie, a respectable linen draper in London,—a companion well suited to him from the uprightness of her mind, the soundness of her religious principles, and the benevolence of her character. They had a son and two daughters: his wife and all his children survive him.

It is believed that Dr. Denman's earliest publication was a treatise on Puerperal Fever, which appeared about the year 1770, and was soon followed by a Letter to Dr. Huck on the construction and use of Vapour Baths. From this period, he was constantly in the habit of printing short tracts on subjects connected with his branch of the profession; which have been, from time to time, incorporated in the several editions of his *Aphorisms on the application and use of the Forceps and Vectis*, and of his *Introduction to the practice of Midwifery*, both of which works are too well known in the medical world to require, in this place, particular notice. They have each gone through five editions; and a sixth of the latter was nearly prepared at the time of the author's death. One of the former editions of it was in quarto, and was accompanied by fifteen engravings, made at very considerable expense, on the generation and parturition of the Human Species, and of Animals. The preface, independently of its professional merits, exhibits much general knowledge and information, and has been highly estimated by good judges as a literary composition. The work has been translated into French, and in that language also is believed to have passed through more than one edition.

Several papers, written by Dr. Denman, will be found in the 5th, 7th, and 11th volumes of the *London Medical Journal*,

conducted by Dr. Foart Simmons. After the publication was discontinued, he became a frequent contributor to the *London Medical and Physical Journal*. He was among the first to recognize the important discovery of his friend and pupil Dr. Jenner; and having satisfied his own mind of its truth and utility, he did not hesitate to announce his conviction, and to support it by some striking facts, the result of his own inquiries, at a time when vaccination had made a comparatively small progress in public opinion. Two letters by him on this subject appeared in the 3d and 4th volumes of the work last mentioned. Communications more immediately connected with his own pursuits were published in the 2d and 14th volumes. In the 27th he wrote a paper on the Structure of Cancerous Parts, and a Description of a curious case of Polypus; and in the 34th another paper on Cancer.

He published in 1809, in the 3d volume of the *Transactions of a Society for the Improvement of Medical and Surgical Knowledge*, a very valuable paper on Excrescences of the Womb; and in 1810, a pamphlet consisting of treatises on the Rupture of the Uterus, on the Snuffles in Infants, and on *Mania Lactea*.

Dr. Denman always felt a strong desire to discover a remedy for cancer, and deemed it almost criminal in medical men to despair of an object so interesting to humanity. To pronounce that dreadful disease incurable, he thought was in some degree to make it so; and his mind was continually on the watch for information on the subject. In 1801, indeed, he was instrumental in forming a charity for the exclusive relief of persons afflicted with cancer, and recommended it by a circular paper, which may be considered as an admirable specimen of the method to be pursued in conducting medical enquiries. Some account of that establishment, which was given up after a trial of a few years, is contained in a pamphlet "on the Cure of Cancer," published by him in 1810: in the following year he wrote observations in this *Journal* on the review of his pamphlet, which it had given. When Mr. Young made public his mode of treating cancer, Dr. Denman was disposed to flatter himself that this great end was on the eve of being accomplished; he gratuitously attended several patients under the

care of that gentleman, in order to become acquainted with his practice; and, having thus ascertained that it was both innocent and beneficial, and believing that it held forth a fair promise of the most important consequences, he introduced it to the public attention by a letter which was inserted in the October number of this Journal. With the same view, he prepared for the press a second edition of his pamphlet on the subject, subjoining a full statement of Mr. Young's system, and his own remarks upon it.

Good sense and practical utility are the leading features in all Dr. D.'s compositions. They not only explain with clearness what had been before discovered, and add the sanction of the author's experience, where it accords with former opinions, but they perform the still more valuable service of correcting such opinions when found to be erroneous, and of enriching the stock of previous knowledge with original observations. It may be stated in particular, that the formidable disease in children called the malignant snuffles, was very little known till it was described by Dr. Denman, who had also the good fortune to point out a mode of treating it, which is generally successful. The evolution of the child, in certain circumstances, by the action of the uterus, is a most curious and important fact, first discovered by him. He was the first also who recommended, in cases of retroverted uterus, the frequent emptying of the urinary bladder by a catheter, as all that was necessary for the restoration of the womb to its proper position. The excitement of premature labour, for the preservation both of the mother and the child, in certain cases of deformed pelvis, is a most important operation suggested by him, which has been successful in almost every instance where it has been adopted. In convulsions preceding labour, particularly where the pulse is slow, he recommended copious bleeding, instead of nervous medicines, and advised that there should be no artificial delivery, until the head of the child shall have passed through the os uteri. These are examples of important practical improvement, which will preserve Dr. Denman's name in remembrance, and give him a just claim to the gratitude of posterity.

This enumeration of his works is most probably incomplete:

but those which have been mentioned will sufficiently prove that the author was constantly employed in endeavoring to improve the medical art, and diminish the extent of human suffering. It is apprehended that they also exhibit an understanding peculiarly gifted with all the faculties, and regulated by all the dispositions, that are most favorable to the investigation of truth. And, when it is remembered that they were all composed in the midst of unceasing professional engagements, always severe, and frequently both harassing and afflicting, they will be allowed to evince an unwearied activity and perseverance in the pursuit of benevolent and useful objects, which are excelled only by the motives that prompted their exertion.

Dec. 22, 1815.

Biographical Notice of W. Nicholson.

[From the London Monthly Magazine, for April, 1816.]

MR. W. NICHOLSON, whose death was recently announced, was born in 1753, in London, where his father practised the law, as a solicitor in the Inner Temple. The son received his education at a school in the north of Yorkshire; but at the age of sixteen he entered into the East India service, in which he made two voyages before the year 1773. He was afterwards employed in the country trade in India; but, in 1776, he was engaged on the continent as a commercial agent to the late Mr. Wedgewood. Soon after this he settled in London, and became a teacher of mathematics; to which profession he added that of an author, translating from the French with great facility, and publishing, besides many useful compilations of his own, chiefly on historical and scientific subjects. In 1781 he printed an "Introduction to Natural Philosophy," in two volumes octavo; which work was well received. In the year following Mr. Nicholson published a new edition of Ralph's Survey of the Public Buildings of London and Westminster, with additions. In 1784 he brought out his "Navigator's As-

sistant, containing the theory and practice of navigation," in one volume octavo. In 1786 we find him publishing, "An Abstract of the Acts relative to the exportation of Wool;" to which subject he was led by his acquaintance with the clothiers. The next year he printed a "Review of the Controversy between Kirwan and the French Academicians on the subject of Phlogiston;" and in the Philosophical Transactions for the same year, is a paper of his containing, "The principles and illustration of a method of arranging the differences of Logarithms, on lines graduated for the purpose of computation." In the following volumes of the Transactions, are two papers of Mr. Nicholson's, one, "The description of an Instrument which produces the two states of electricity without friction, or communication with the earth;" the other, "Experiments and Observations on Electricity." In 1788 appeared his translation of Fourcroy's Elements of Natural History and Chemistry, in four volumes octavo; to which, the year following, he added a supplemental volume, "On the first principles of Chemistry." In 1790 Mr. Nicholson translated from the original manuscript, "Memoirs and Travels of the Count de Benyowsky," two volumes, quarto. The next year came the translation of Chaptal's Elements of Chemistry, in three volumes octavo. In 1795 appeared, "The Dictionary of Chemistry," in two quarto volumes; and, two years afterwards, the first number of his "Journal of Natural Philosophy, Chemistry, and the Arts;" which was printed originally in the quarto form, but was afterwards changed to an octavo. About the year 1799 he opened an establishment in Soho for twenty pupils, which institution he carried on several years; but it at last declined, chiefly owing, as we believe, to the attention paid by Mr. Nicholson to other objects; particularly the West Middlesex Water-works, the plan of which originated with him, as did that for the supply of Portsmouth and Gosport. He was also engaged in a similar undertaking for the borough of Southwark; and, besides these different concerns, he prepared drafts of patents for mechanical inventions. In 1799 he printed a work translated from the Spanish, "On the Bleaching of Cotton Goods, by oxygenated muriatic acid;" and, in 1801, appeared, "A general System of Chemical Knowledge, with a set of synoptic tables from

the French of Fourcroy," in two volumes octavo, and one in folio. In 1808, he printed "A Dictionary of Chemistry," in one closely-printed volume octavo; and this was followed by another work with his name, entitled, "The British Encyclopedia," in six volumes octavo, in which he had little personal trouble, but it is false that the same person wrote this and the similar work of Dr. George Gregory; the latter gentleman having diligently superintended the Cyclopedia which bears his name, though aided by various co-operation. In 1810 Mr. Nicholson had some dispute relative to the work in which he was employed, as engineer to the Portsea Island Water-work Company, on which he published, "A Letter to the Proprietors of the Portsea Water-works, occasioned by an application made to them by the Assigns under an act for bringing water from Farlington." This truly ingenious and indefatigable man shared the common fate of projectors, to be continually employed without enjoying any material advantage from his labours. Though incessantly occupied in useful concerns, and ardent in promoting the interests of science, he was generally embarrassed in his circumstances; and, notwithstanding his uncommon industry, he lived in trouble, and died poor.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

FOR THE ECLECTIC REPERTORY.

The Editors are pleased to have it in their power to lay before their readers, the following interesting Communication from Dr. Physick, which has just been handed to them. Had it been sooner received it would have occupied a more appropriate place in this Number.

HAVING repeatedly experienced considerable delay in the healing of wounds from ligatures applied on divided arteries remaining a long time in the sore before they could be removed, I have for many years been very desirous of avoiding such an inconvenience in the use of ligatures. With this view, the first idea that occurred was that of drawing the ligature tight on the vessel by the assistance of a double canula: unfortunately, the first patient on whom it was employed for securing the femoral artery, died of tetanus; and though I by no means believe the disease to have been occasioned by the instrument, yet the event discouraged from further trials of it.

Several years ago, recollecting how completely leather straps, spread with adhesive plaster, and applied over wounds for the purpose of keeping their sides in contact, were dissolved by the fluids discharged from the wound, it appeared to me that ligatures might be made of leather, or of some other animal substance, with which the sides of a blood-vessel could be compressed for a sufficient time to prevent hemorrhage; that such ligatures would be dissolved after a few days, and would be evacuated with the discharge from the cavity of the wound.

Under this impression, I requested Dr. Dorsey to try the experiment on a horse, by using a ligature of buckskin. This was found to answer every purpose, and came away in a few days.

This fact was mentioned at the time to several of my medical acquaintance; and I understand that Dr. Hartshorne has lately tied up some of the arteries after amputating the thigh, with ligatures of parchment. They were found dissolved at

the first dressing. Dr. Dorsey, in several operations, in which I have assisted, has used ligatures of French kid, which he finds stronger than any other leather. He has it cut into narrow strips, stretches them and peels off the coloured polished surface. No hemorrhage has taken place in any instance, and the ligatures are found dissolved at the end of two or three days.

With the view of ascertaining what animal substance would withstand the solvent power of pus for the longest time, I suggested the plan of trying different articles, by applying them over the surfaces of ulcers. Buckskin, kid, parchment, and catgut, have been tried in this way. The buckskin and kid dissolved first; then the parchment; when at the same time the catgut was but little changed. From an apprehension that in tying large blood-vessels the leather might dissolve too soon, I have requested Dr. Dorsey, to try leather impregnated with the varnish used by Mr. Bishop of this city, in making elastic catheters; in the hope that when so prepared it will be somewhat more durable. Perhaps tendon would be found to answer the purpose. Future experiments will probably place at the command of the surgeon a variety of these ligatures, which may be so selected as to remain the exact length of time he may require.

This hasty notice on the subject is given, because it is thought important that these facts should be made public without delay.

P. S. PHYSICK.

Philadelphia, July 9, 1816.

FOR THE ECLECTIC REPERTORY.

A STONE was extracted from the bladder of a patient in the Pennsylvania Hospital on the 8th July, by Dr. Dorsey, which was found to have concreted round a mass of lead an inch in length and nearly half an inch in width. This singular nucleus consists of two laminæ of thick sheet lead, weighing two drachms

and thirty-eight grains. The patient, an intelligent man, declared himself unable to imagine any way in which it could have reached his bladder. Its size and irregular shape would certainly render it difficult to introduce it through the urethra; and yet scarcely a doubt can exist that it originally entered by that passage. The stone was soft and not unusually large.

FOR THE ECLECTIC REPERTORY.

Upas Tree.

The following extract from the Diary of an intelligent fellow-citizen will be read with interest, as the accuracy of the relation may be relied on; and it is only by actual and unprejudiced observation, that the true nature of this wonderful production will be rightly understood.

IN the morning we rode out to see the *Upas Tree*, with the sap of which the Malays poison their weapons. It is about three miles from the town of Balawangie or Balemboang, on the south-east end of the island of Java, and is much loftier than the tallest Lombardy poplar; the branches begin to grow from the trunk like the palm tree, at a considerable distance from the ground. I had an opportunity of proving, by ocular demonstration, that the accounts which we have had of its destroying the vegetation and killing any birds that may fly over it, are totally without foundation. I was myself under the tree a considerable time, rubbed my hand over the trunk, and saw birds fly on and off without any injury. The vegetation around it is remarkably luxuriant, extending to the very root of the tree.

The poison is extracted by making an incision in the trunk and catching the sap in a bamboo, and that it is deadly in the extreme I had an opportunity of proving. A bamboo, sharpened into the size and shape of the blade of a small penknife, was dipped in the sap and stuck in the leg of a dog, tied by a long string to a tree; in five minutes he began to be very much agitated; in ten he was in strong convulsions; in sixteen he

was raving mad, frothed at the mouth, and appeared in the greatest agony; this lasted about five minutes, when he sunk down exhausted: he lay a few moments apparently dead, when he again sprung up raving mad, foaming at the mouth for a minute or two, when he gave a yell and expired.

The tree was covered with numerous incisions, where the Javanese had been extracting the poison. There are but two of these trees on the island, one about one hundred miles from Batavia, and the one above mentioned. There are two kinds of the Upas Poison; the one, it is said, only affects quadrupeds and does not injure fowls of any kind, and the other *vice versa*.

Extract from Diary, October 10th, 1815.

*An Ordinance providing for the gratuitous Vaccination of
Persons in indigent circumstances.*

WHEREAS it hath been sufficiently established, that VACCINE VIRUS, when effectually communicated to the human system, is a preventive of SMALL POX, and it being a duty to contribute to the extension of this distinguished blessing—Therefore,

Sect. 1. *Be it ordained and enacted by the Citizens of Philadelphia, in Select and Common Councils assembled:* That the City shall be divided into four districts, as follows, viz. East and West by the centre of Delaware Eighth street, and North and South by the centre of High street.

Sect. 2. *And be it further ordained and enacted by the authority aforesaid,* That the Mayor be, and is hereby authorized, immediately after the passing of this act, and annually hereafter in the month of January, to appoint one qualified person for each of the said Districts, whose duty it shall be to call upon each and every family resident within his District, and inquire of every such family, whether any, and if any, what members thereof may be liable to Small Pox disease: and if it be found that any person should be so liable, being in

indigent circumstances and unable to defray the expense, to offer the services of the Physicians of the Corporation to Vaccinate such gratuitously, and if the said offer be accepted, the Collector of cases shall proceed to record the number of the house, and the name or names of such persons, in a Book, alphabetically arranged, to be provided and kept for that purpose.

Sect. 3. *And be it further ordained and enacted by the authority aforesaid,* That the collector of cases shall, at least once in each week, make two fair transcripts of the names and residence of the persons entered in his original Book of Record during that time; one of which copies shall be filed in the Office of the City Clerk, and the other furnished to the Physician appointed to have charge of the District to which the said Collector shall belong.

Sect. 4. *And be it further ordained and enacted by the authority aforesaid,* That for the services required to be performed by the Collectors, in virtue of this Ordinance, they shall, for every case procured to be vaccinated by them, be paid the sum of ten cents; and upon their quarterly presentation of their accounts to the Mayor, certified by the City Clerk, that the number of cases charged therein are filed in his Office, he shall draw his warrant on the Treasurer, directing, for the present year, that the same be charged to account of any Monies in the Treasury, not otherwise appropriated, and for every year hereafter, to such fund as Councils may assign for that purpose.

Sect. 5. *And be it further ordained and enacted by the authority aforesaid,* That immediately after the passing of this Ordinance, and annually hereafter in the month of January, the Mayor be, and he is hereby authorized, to appoint four respectable Physicians, who shall have conferred on them, Degrees of Doctor in Medicine in the University of Pennsylvania; and assign one of the said Physicians to each of the Districts erected by the first section of this Ordinance, whose duty it shall be, upon receiving the List of cases furnished by the Collector, to Vaccinate each and every person so reported to him, at their respective places of abode, and continue to visit every such patient as often as may be necessary to enable him to as-

certain, whether the person or persons so vaccinated have passed through the said Vaccine disease.

Sect. 6. *And be it further ordained and enacted by the authority aforesaid,* That each of the Physicians hereby provided to be appointed, shall keep a Book, wherein shall be recorded, the name, age, and place of residence of every person he shall vaccinate, stating whether the patient has had the Vaccine disease, or not, with such other notes as in his judgment it may be proper to preserve; and the said Physicians are hereby required and enjoined, at the expiration of every three months, calculating the commencement from and after the day of their appointment, to make a fair copy of the Records made in their Books, during the term of each three months, and deposit the said transcript for safe keeping in the Office of the City Clerk. And it shall be the duty of the said Clerk, annually, to publish a Statement of the number of patients thus vaccinated in each District, with the name of the Physician by whom they were vaccinated.

Sect. 7. *And be it further ordained and enacted by the authority aforesaid,* That in consideration of the services to be performed by the Physicians, to be appointed for carrying this Ordinance into effect, they shall each be paid one hundred dollars per annum; and the Mayor is hereby empowered to draw his warrant on the Treasurer, quarterly, if desired, in favour of the said Physicians; directing, for the present year, that the same be charged to account of Monies in the Treasury, not otherwise appropriated, and annually hereafter, to such fund as Councils may apply to the purpose.

Enacted into an Ordinance at the City of Philadelphia, on the thirty-first day of May, in the year of our Lord one thousand eight hundred and sixteen.

JAMES S. SMITH,
President of the Common Council.

ROBERT RITCHIE,
President of the Select Council.

JOHN C. LOWBER,
Clerk of the Common Council.

Vaccination in Hayti.

FEBRUARY 8, 1816. We have great satisfaction in announcing that we this day enjoy the blessing of Vaccination; and that we need no longer dread the ravages, in our warm country, of that insatiate scourge, the Small Pox.

Mr. Prince Saunders, lately arrived from London, has brought out the Vaccine fluid; with authentic documents from Mr. Moore, the Director General of Vaccination in England, for its use. Mr. Saunders has already vaccinated the children in the palace of Sans Souci; and his Majesty has directed all the physicians of Hayti to take instructions from him on the subject. He has also ordered, that establishments be made in all the parishes for the effectual vaccination of all the inhabitants liable to the infection of Small Pox.

We are informed, on good authority, that we are indebted for this great blessing, under God, to the virtuous Mr. WILBERFORCE, the venerable father of the abolition of the Slave Trade. This great man—whose labours are all directed to the promotion of human happiness—when he learned that Vaccination had not been introduced into Hayti, expressly engaged Mr. Prince Saunders, who was then on the point of embarking, to suspend his voyage, in order to gain instruction in the art of Vaccination, for the sole purpose of introducing the blessing into Hayti.

PROCEEDINGS OF PHILOSOPHICAL SOCIETIES.

[From the Annals of Philosophy, for March, 1816.]

ROYAL SOCIETY.

On Thursday the 25th of January a paper by Sir Humphry Davy was read, containing further experiments on the effect of wire sieves to prevent the combustion of gases from passing through them. A sieve formed of wire $\frac{1}{50}$ th of an inch in diameter, and containing 10 wires in the inch, prevented the

combustion from penetrating; but when agitated in an exploding mixture explosion took place. The explosion likewise took place when the wire became red-hot. When there were 14 wires to the inch, agitation did not occasion an explosion. With 24 wires to the inch, the mixture did not explode even when the wire became red-hot. The author accounts for these singular phenomena in this manner. A red-hot wire of a considerable size is required to produce an explosion in gases; hence, when the wire is very small, explosion does not take place, even when the wire becomes red-hot. The gas will not explode till it acquires a certain temperature. Now in the experiments with the wire sieves this temperature only takes place at the top, where the gas is so much diluted with azote and carbonic acid gas, that it is incapable of exploding.

At the same meeting a paper by Dr. Wilson Philips was partly read, containing experiments on the nervous influence in secretion. In two former papers he had shown, that the circulation of the blood and the action of the muscles were independent of the nervous influence, and that this influence only acted on the muscles like any other stimulus. But the case is very different with the secretions. Whenever the nervous influence is interrupted the secretion is at an end. Several rabbits had the eighth pair of nerves divided, and in all of them the parsley, which they ate after the operations, remained in the stomachs quite unaltered, and exactly resembled parsley chopped small with a knife. The stomach was always much distended, and a portion of the food was contained in the œsophagus. This was owing to the unsuccessful attempts which the animal made to vomit, which always follow the division of the eighth pair. The animal soon shows a violent dyspnœa, and seems to die at last of suffocation.

Since the experiments of Galvani on animals, it has been a favourite opinion of many physiologists that the nervous influence is the same with galvanism. To put this to the test of experiment, a portion of the hair of a rabbit opposite to the stomach was shaved, a shilling tied on it, the eighth pair was divided and the extremities of the nerve coated with tinfoil. These were connected with a galvanic battery of 47 pairs of plates four inches square. The trough was filled with a liquid com-

posed of one part muriatic acid and seven parts water. This action was kept up for 26 hours. No dyspnœa took place, and after death the food in the stomach was found as much digested as in the stomach of a healthy rabbit which had eaten food at the same time. The smell of the parsley was destroyed, and the smell existed which is peculiar to the stomach of a rabbit during digestion. This experiment was several times repeated with the same result. So that it appears that the galvanic energy is capable of supplying the place of the nervous influence, so that while under it the stomach digests food as usual.

Mr. Wilson likewise made a number of experiments to show that heat is a secretion from the blood produced by means of the nervous energy. When new drawn blood is subjected to the action of the galvanic battery, it continues several degrees hotter than blood not subjected to the same process.

It appears to me that Mr. Wilson has gone rather farther than his experiments will warrant, when he concludes that the nervous influence and galvanism are the same. It is clear that the section of the nerve interrupts the nervous influence. Mr. Wilson's experiments (supposing them correct) show us that galvanism puts an end to this interruption. But it may do this merely by serving as a conductor to the nervous influence.

On Thursday, the 1st of February, Dr. Wilson Philips' paper was continued: he considers it as proved by his experiments that the ganglia communicate to the nerves proceeding from them the general influence of the brain and spinal marrow. Nerves proceeding from them supply all the involuntary muscles. But if this be the case, it will be asked, how comes the digestive power of the stomach to be destroyed by cutting the eighth pair of nerves, seeing that the stomach is supplied with nerves from ganglia? The eighth pair coming from the largest portion of the nervous matter possesses the greatest influence; but the digestive power of the stomach is weakened likewise by the interruption of the nerves proceeding from ganglia. This he proved by destroying part of the lower portion of the spinal marrow of different rabbits. In every case the digestive power of the stomach was impaired or destroyed; the urinary bladder and rectum lost the power of discharging their contents, and paralysis of the lower extremities ensued,

anda great degree of cold took place. The heat of one rabbit before death sunk as low as 75° . Though the power of the stomach as an organ of digestion is destroyed by cutting the eighth pair of nerves, still its muscular power remains; but it does not act as usual, because the stimulus of digested food is wanting; or it acts so as to throw the food out of the stomach the wrong way, in consequence of the unnatural stimulus of undigested food.

On Thursday, the 8th of February, Dr. Wilson Philips' paper was concluded. He showed that the heat of animals was in all probability owing to the nervous energy. He finished his paper with a general view of the facts which he had established in the three papers which he had laid before the Royal Society. The muscular energy depends upon the particular structure of the muscles; the nervous system is supported by the sanguiferous; but the sanguiferous can act without the influence of the nervous system. Secretion and animal heat are entirely dependent upon the nervous system. Hence the muscles cannot for any length of time continue to exert their energy if the nervous influence be cut off. The nervous influence appears the same with the galvanic energy.

At the same meeting a paper by Dr. Brewster, on the structure of the crystals of fluor spar and common salt, was read. Haüy had observed that all minerals whose primitive forms were symmetrical, as in the cube and tetrahedron, refract singly; these figures belong to fluates of lime, common salt, alum, &c. Biot first attempted to give a reason for this curious circumstance. He observed that doubly refracting crystals act upon light two ways; some draw it nearer the axis, while others repel it to a greater distance: the first exert an attractive, the second kind a repulsive force. The crystal of fluor spar, &c. according to Biot, are intermediate between the other two, and therefore neither attract nor repel. Dr. Brewster found that crystals of fluor spar and common salt, in certain cases, depolarize light, in others not. Whenever any deviation from the exact figure of the crystal takes place, they acquire the power of depolarizing; and the deviation may be either towards the side of attraction or repulsion.

On Thursday, the 15th of February, a paper by Mr. Tod,

surgeon in the navy, was read, containing some experiments and observations on the torpedo electricus. While the ship *Lion*, in which Mr. Tod was, lay at the Cape of Good Hope, a considerable number of this fish was caught by the seine, but none by the line, though they fished with every kind of bait in the very place where the fish was caught by the seine. When caught, it was put into a tub of water, where it lived usually three, and in one case, five days. Mr. Tod in the paper gives a description of the fish, and mentions its general size, which is known to be small. The fish discharged the electric energy at pleasure, and it ceased with the life of the animal. When caught, it attempted in the first place to make its escape by muscular exertion, and did not exert its electric energy till it found the first attempt unsuccessful. A motion of the eye of the fish was generally perceptible when it exerted its energy, so that Mr. Tod could generally tell when the shock was given to another person who held the animal in his hand; the shock never reached farther than the shoulder, and often not farther than the elbow.

At the same meeting, two papers by the Rev. Abraham Robertson, D.D.F.R.S. were announced: the first giving a method of calculating the excentric from the mean anomaly of a planet; the second containing a demonstration of Dr. Maskelyne's method of finding the longitude and latitude of a celestial object from its right ascension, and *vice versa*; and pointing out two mistakes to which Dr. Maskelyne's method is liable.

On Thursday, the 22d of February, a paper by Sir Everard Home was read, giving an account of the mechanism of the feet of an East India species of lizard, which is capable, like the common fly, of walking up and down the perpendicular face of smooth walls without falling. This mechanism consists in a particular muscular contrivance, by which a quantity of air contained between the wall and the foot of the animal, enclosed within a kind of cartilaginous ring, is rarefied so much as to enable the foot of the animal to adhere with sufficient force to support the whole weight of the body. This rarefaction is continued without any muscular exertion after it has once taken place. There can be little doubt that the foot

of the fly is constructed in the same way, though its size is so small that nothing can be determined by inspecting it with the naked eye. When high magnifying powers are employed, the observer is so liable to be deceived by appearances that nothing very precise can be determined on the subject.

LINNÆAN SOCIETY.

At the meetings of the society on the 6th and the 20th of February, a paper was read by Robert Brown, Esq. librarian to the society, containing general observations on the tribe of plants called Compositæ. This paper contained many curious remarks upon the structure of the flowers of this difficult tribe of plants, marked by the precision and sagacity which characterize all the papers of this acute observer; but of so miscellaneous a nature that it is scarcely possible to give any abstract of it without transgressing our usual limits.

ROYAL INSTITUTE OF FRANCE.

Account of the Labours of the Class of Mathematical and Physical Sciences of the Royal Institute of France during the year 1815.

PHYSICAL DEPARTMENT.—*By M. le Chevalier Cuvier, Perpetual Secretary.*

Another year of devastation and terror! The bloody discord of our new country, the existence of this fine kingdom brought into doubt, the repose and the fortune of the most peaceable citizens for some time without protection or security; innumerable armies inundating our provinces, taking possession of our towns, seizing by violence in the midst of a conquered capital those treasures of the arts formerly collected in a manner equally violent. Such, to the most innocent, have been the consequences of a too culpable attempt. But the sciences bring with them a state of consolation and tranquillity. At present all nations respect them. In the midst of the tumult of arms, our Archimedes have nothing to fear from enlight-

ened soldiers, to whom their names and their labours are known, and who rejoice to become for a short time their disciples. It is perhaps even in the most terrible moments that, taking refuge in profound meditation, emancipating themselves by the exaltation of their minds from the horrors that surround them, they have made some of the most fortunate combinations, and some of the most fruitful discoveries. We shall find, at least, that the list of the labours of this year is not inferior to that of the most peaceable time.

CHEMISTRY.

We have been speaking for two years of those acids without oxygen, or, as they are now called, *hydracids*, which have made so considerable a breach in the imposing chemical edifice of Lavoisier. The labours of Gay-Lussac have shown this year that there is one more to add to this class—the acids called *prussic* by M. de Morveau, because it enters into the composition of Prussian blue; and its radical not being then known, it was not possible to give it a name from that substance.

The experiments of Margraaf, Bergman, and Scheele, demonstrated that in Prussian blue the iron was united to a substance which acted the part of an acid. Berthollet has long suspected that no oxygen entered into its composition, but merely carbon, azote and hydrogen. The truth of this suspicion has been ascertained by Gay-Lussac.

On decomposing, with the precautions which he indicates, the prussiate of mercury by muriatic acid, he obtained pure prussic acid; and we have already in one of our preceding reports spoken of the singular properties which he ascertained it to possess in that state, particularly its great volatility. Burning this vapour by means of oxygen and the electric spark, he obtained determinate quantities of water, carbonic acid, and azote. He abstracts the oxygen consumed in the formation of the first two bodies, and obtains this conclusion, that one volume of the vapour of prussic acid results from the combination and concentration of one volume of the vapour of carbon, half a volume of azote, and half a volume of hydro-

gen; or, expressing these volumes in weight, according to the density of the vapours, 100 parts of the acid contain,

Carbon	44.39
Azote	51.71
Hydrogen	3.90
	<hr/>
	100.00

This prussic acid contains more azote and less hydrogen than other animal substances, from which it is particularly distinguished by the absence of oxygen.

This is the first known hydracide with a decomposable base. Gay-Lussac has likewise succeeded in obtaining this radicle in a separate state. The accidental name *prussic* not being proper, he has given it the name of *cyanogen* (that is, *producing blue*). Henceforth prussic acid must be called *hydro-cyanic acid*; its saline compounds, *hydro-cyanates*; and the compounds of its radical, *cyanurets*.

We wish it were in our power to give an account of the numerous and delicate experiments by which Gay-Lussac has reduced under the one or the other of these classes, the different products of the action of prussic acid upon bodies, and the properties which he has recognized in them. Let it suffice to say, that Prussian blue rather appears to him a cyanuret of iron containing water than a *hydro-cyanate*, or to use the old name, a *prussiate*.

Cyanogen itself possesses peculiar properties. It is a permanently elastic fluid, of the specific gravity 1.8064, having a peculiar and strong odour, giving a sharp taste to water, and burning with a purple flame. Water absorbs four times its volume of it, and alcohol twenty-three times its volume. Its direct analysis gave the same results as that of hydrocyanic acid, namely one volume of vapour of carbon, and half a volume of azote.

Gay-Lussac has likewise presented to the class, memoirs on the cold produced by evaporation, and on evaporation in air of different degrees of temperature and density, in which he expresses by a formula the result of his experiments. He has, likewise, given a memoir on hygrometry, containing the

immediate consequences of these experiments; but these works not having, in his opinion, acquired that precision and order which he is accustomed to give to all that he publishes, the author has thought proper to defer the printing of them.

M. Dulong, professor at Alfort, has presented some experiments on oxalic acid, which, though not constituting a complete work, open interesting views for the science. When this acid is saturated with barytes, strontian, or lime, we obtain always salts, which represent the acid employed even when they have been exposed to a heat higher than that of boiling water. But with oxide of lead, or of zinc, we always lose 20 per cent. of the acid by drying. When these metallic salts are afterwards strongly heated, no water makes its appearance; but we obtain carbonic acid and carbonic oxide, and there remains behind the oxides of the metals employed, of which that of lead possesses particular properties. The oxalates of copper, silver, and mercury, on the contrary, always give out water when decomposed, how dry soever they are previously made. Carbonic acid is likewise given out, and the base remains in the metallic state. The oxalate of silver detonates, and we know already that it detonates when struck, as well as the oxalates of mercury.

As to the oxalates of barytes, strontian, and lime, they give, when decomposed by heat, empyreumatic oil, water, carbonic oxide, carburetted hydrogen, carbonic acid, and there remains a mixture of subcarbonate and charcoal.

These phenomena may be explained two ways. Oxalic acid is either composed entirely of carbon and oxygen, in proportions intermediate between those of carbonic acid and carbonic oxide; but it contains water, which certain oxalates, as those of lead and zinc, lose when dried; while others retain it. Or it is a compound of carbonic acid and hydrogen. This last constituent, with the oxygen of the oxide, will form water, which these first oxalates likewise allow to escape, and nothing remains but carbonic acid and the metal, a combination quite new in chemistry: for it is regarded as a general principle, that metals are capable of uniting with acids only after being oxydised. M. Dulong, who is inclined to this last explanation, conceives of course, that the dried oxalates of lead and zinc

are not real oxalates, and he proposes to give to them, as well as to similar compounds that may be discovered, the name of *carbonides*. The oxalates which do not give water by drying, contain the oxalic acid entire; and as from its composition it will be named hereafter *hydro-carbonic*, the salts will take the name of *hydro-carbonates*.

M. Dulong is led by analogy to very general conclusions, by which he reduces under the same laws, not only the ordinary acids, but likewise the hydracids. But we shall give a more detailed account of his opinions, when he sends up the memoir in which he intends to consign them.

The chemical action of solar light on bodies is worthy of all the attention of philosophers, from its influence on most of the phenomena of living nature; yet it has hitherto been but little examined. M. Vogel has just added some experiments to those which we formerly possessed. Ammonia and phosphorus, which do not act on each other in the dark, when exposed to the solar light disengage phosphoretted hydrogen gas, and deposit a black powder composed of phosphorus and ammonia intimately united. Nearly the same thing takes place with phosphorus and potash. The action of the different rays are not always similar, the red rays produce no effect on the solution of corrosive sublimate in ether, while the blue and complete light produce a mutual decomposition. The metallic permuriates are brought in the same way to the state of proto-muriates.

We have said a few words in our two last reports on the researches of M. Chevreul, assistant naturalist to the Museum of Natural History, concerning soap and saponification. This skilful experimenter has ascertained that the action of potash on tallow produces new modes of combination; from which result substances which did not exist before perfectly formed, and two of which, margarine and a species of fluid oil, acquire all the properties of acids. The author, pursuing his experiments, has ascertained that the same effects are produced by soda, the alkaline earths, and different metallic oxides, and that the resulting substances are in the same proportion, whatever agent we have employed. Magnesia and alumina, on the contrary, merely contract a certain union with tallow, without se-

paring its elements into two distinct bodies. The quantity of alkali necessary to convert a given portion of tallow into soap is exactly that which saturates the margarine and oil which the tallow produces. Our laborious chemist has terminated his memoirs on this subject, by giving the capacity of saturation of margarine and fluid tallow, and by describing the properties of several new soapy combinations which he produced by double decompositions, by mixing a hot solution of soap, of fluid tallow, and potash, with different earthy and metallic salts. Thus he has rendered the soaps, the study of which has been hitherto neglected, almost as well known as the salts with which chemists have been the most occupied.

The late M. Fourcroy made known, under the name of *adipocire*, a substance separated by means of acids from the fatty matter into which animal bodies buried in the earth are converted. And he considered it as identical with the crystalline matter in human biliary calculi, and with the spermaceti found abundantly in certain cavities of the head of the Cachalot.

M. Chevreul, led by his experiments to examine these substances, has found that the crystalline matter of biliary calculi does not form soap, while spermaceti furnishes it as easily as tallow; but producing a somewhat different alteration in other proportions and with particular properties. The fatty matter of dead bodies is much more compound than Fourcroy had supposed, containing different fatty bodies combined with ammonia, potash, and lime. It is a fatty matter that has already experienced the action of alkalies.

Every person must have observed a resinous excretion of a yellowish-orange colour, which exudes from cracks in the bark of the beech faggots exposed to moisture. It has the shape of ribbons, twisted like vermicelli. M. Bidault de Villiers has made some chemical experiments on this matter. One portion of it dissolves in water, another in alcohol, and the residue possesses some of the properties of gluten. Nitric acid converts it into oxalic acid, into a yellowish bitter principle, which is very abundant, and into a fatty matter; but produces no saccharic acid. When heated it gives abundance of carbonate of ammonia, and a fetid oil; so that the commission-

ers of the class were led to consider it as approaching very closely to an animal substance. It would be interesting to inquire into the cause of its production.

One of the periods in which chemistry has shown itself most brilliant and most useful, was certainly that in which France, separated for twenty years from countries whose productions had been considered for so long a period as real necessities, was obliged to supply them by the products of its own soil. The known arts have been perfected and new ones created. We have seen in succession soda extracted from common salt; alum and copperas formed by uniting their ingredients; colours considered as fugitive rendered permanent; indigo from woad supplying that from the indigofera; madder supplying the place of cochineal; and sugar from beet employed as a substitute for that from the sugar cane.

This last article, the most important of all, is far from having lost its interest even at present. Many of the manufactories, indeed, have fallen; but those which were properly conducted still subsist and prosper; and according to M. le Comte Chaptal, their product will always be able to rival the sugar of the colonies. This skilful chemist gives an unanswerable proof of his assertion by continuing to manufacture with profit. It is true that in all the details of the culture, harvest, and preparation, and likewise in the employment of the different waste matters, he has applied all the lights of science and experience, so as never to throw away what can be of any service, and to apply to other uses what he is obliged to reject. He has described his processes in a manner sufficiently clear to be understood by all the manufacturers, and we have reason to hope that his work will assist in preserving to France a precious manufacture, which a thousand events may again render necessary to the country.

The third volume of the *Elementary Chemistry* of Thenard has been published. This skilful professor describes in it with great minuteness, and according to the most recent discoveries, for many of which the science is indebted to himself, the immediate principles of organized bodies, the different products of their decompositions, and their uses in the arts. The fourth, which is in the press, will terminate the work.

Professor LOEBEL's *Observations upon the Benefit of Insolation in different Complaints, particularly in Cases of the Amaurosis.*

[From the London Medical and Physical Journal, for Feb. 1816.]

THE physicians of former times cured different complaints by exposing the suffering parts to the action of the sun-beams, and practised this method particularly in disorders of the lymphatic system, such as different kinds of dropsy, and the gout. Professor Loebel has proved, in a dissertation, that insolation is with injustice neglected at present. According to his opinion the effects of insolation upon the suffering organs are the following:

1. The warmth of the sun increases the activity of the lymphatic system, and of the vessels.
2. By the influx of light, the vital activity is roused and heightened both in the afflicted part and the whole body.
3. The development of oxygen, or vital air, caused by the action of the sun, also operates chemically upon the organization.

For these reasons, M. Loebel recommends insolation in the following cases :

1. In chronic anasarca, not founded upon any organic defect, where the extremities feel cold, and a general weakness and torpor appears in the lymphatic system, particularly in metastatic exanthema, after repelling the tinea capitis, the itch, or herpes, or after an ill-managed scarlatina.
2. In the chronic gout, particularly when all the organs are suffering by its long duration, when contractions, tumores ossium, and insupportable pains prevail, also where the gout leaves a partial palsy.
3. In all complaints attacking the tractus intestinorum, such as chronic spasms of the stomach, where weakness in the nervous system prevails, and in chronic diarrhœa; as also in the fluxus cœliacus and hepaticus, in chronic catarrh and chronic erysipelas.
4. In different forms of venereal complaints, in particular during the use of mercurials, when it serves to heighten and increase the effect upon the lymphatic system and the skin.

5. In diseases of the bones, tumores ossium, and in general or partial caries.

6. In subjects weakened by immoderate venery.

7. In nervous apoplexy, and palsy of single parts.

8. In the nervous gout of the head.

9. Against aphony when the incapacity of speaking is transitory, and not occasioned by the destruction of the organs.

10. In the marasmus senilis.

11. In the palsy of the lower extremities; particularly where the nervi crurales have suffered, and a state of inactivity and want of irritability prevails in them.

12. In amaurosis, from idiopathic causes, and from weakness of the retina or ciliary nerves, or when a palsied state of the optic nerve produces this complaint, or when it arises from a metastasis of gouty, venereal, or itchy matter.

Contra indications of the method of cure are the following:

a. In all diseases where an exalted irritability or plethora prevails, insolation must not be applied.

b. Neither in acute violent inflammations, general nor local; in affections of the lungs, which show a disposition to inflammations, spitting of blood, or congestion.

c. Apoplexy, the nature of which consists in a congestion.

d. In hemorrhages both of the active and passive kind, insolation is improper.

e. Insolation must absolutely be refrained from where the patient shows an idiosyncrasy or apathy against this method of cure, or by persons whose nerves, when in health, were found too sensible of the action of light or sun-beams, and who felt head-ach or vertigo on the slightest action of sun-shine.

Manner of application.—1. This method of cure must not be applied in stormy or moist weather, or when east, west, and north winds prevail. Insolation requires calm days.

2. The patient during insolation must not sit or lie on the bare ground, but a leather skin must be placed under him, as was the custom of the Greek and Roman physicians.

3. Insolation must neither be applied on an empty stomach, nor directly after dinner; but, if the complaint requires the application during noon-tide, it is advisable to let the patient previously take a little food.

4. If insolation is to be performed on single suffering parts, the rest of the body must be covered with a white linen cloth, and only that part exposed on which the sun-beams are to act.

5. Insolation must be adapted to the different cases: in one case half an hour or an hour is requisite, in others a period of some hours. Again, in some cases the rays of the morning sun, in others the most powerful rays of noon or afternoon are necessary, according to circumstances and individuality. In complaints of the eyes, viz, in amaurosis, Mr. Loebel advises to shut the eye-lids, and to let the sun-beams act through half convex glass, placed upon the eyes thus shut.

Mr. Loebel gives the following directions for a particular machine which he calls a sun-bath. It consists of a box entirely constructed of panes of glass, about three feet long, nearly in the form of a hot-bed, the bottom to be of wood covered with sole-leather, the sides about three or four feet in height, of panes of glass. In the upper part, an opening for the patient to put his head through; on one side a glass door by which to enter; and the bottom must be covered with very dry sand, or kitchen salt, about a quarter of a yard high. This box must then be exposed to the sun, so that the beams, thus more concentrated by the panes of glass, may produce a stronger effect upon the subject enclosed; for which reason there ought also to be glass doors in the machine, that the degrees of heat may either be increased or lessened. The preference of this sun-bath to the usual method of insolation amongst the ancients consists in the more effectual application of the sun-beams upon the naked body, in proportion to the complaint, and according to the will of the physician; and, in case the perspiration of the patient takes place, the risk of catching cold is thereby absolutely prevented. The effect of the heat must also be far more powerful and concentrated than can be the case by pursuing the ancient method. Besides, the ancient method cannot always be applied either in England or the northern parts of Germany, without risk to the patient, on account of the instability of the atmosphere; but the sun-bath recommended here may, with proper precaution, be applied more frequently and with greater confidence.

6. Finally, insolation must not be applied alone, but combined

with those remedies adapted and prescribed for every form of sickness, as many cases require not only inward medicines, but also outward applications, such as frictions, &c.

Professor Loebel communicates the following remarkable cure of an amaurosis by applying local insolation.

J. S., a native of Dresden, forty years of age, had served from his nineteenth to his thirty-fifth year in the Saxon infantry, and amongst other excesses had profusely indulged in venery. When thirty-seven years old, he suffered much from the gout, but was restored. About two years after, he was seized with nervous apoplexy, which palsied his whole right side: he was also cured of this complaint, but it left a weakness in the organs of sight, which, in 1809, amounted to amaurosis in his right eye; by his left he saw, as he expressed himself, only as through a gauze. In 1810 he consulted Mr. Loebel, who, on close examination, was convinced that this amaurosis, the consequence of a complaint in the *nervi ciliares*, was connected with a weakness general to the whole organ. He therefore gave him a number of stimulating and nervous remedies internally and locally. Among the rest, very small doses of phosphorus. Under this management, the sight of the left eye was sensibly improved, and the gauze-like film disappeared; but the right eye, notwithstanding the inward and outward application of phosphorus, remained insensible, and the pupilla remained immovably enlarged, and paralysed. He now resolved to apply local insolation, along with the use of the following prescription:

R. Rad. Valer. Pulv. ʒijss.

Caryophyl. Arom. ʒj.

Cortic. Cinnam. ʒss.

Spir. Vin. Gall. Opt. ʒiv.

To be taken, a table-spoonful every two hours. For this purpose he fixed a silver wire round what is called a burning-glass, and, by means of ribbons fastened to each side, tied this convex glass upon the eye afflicted with the amaurosis; then caused the rays of the meridian sun to operate through this glass, at first, only for half an hour. He directed the patient to shut his eye-lids during the insolation, and ordered the other parts of the head to be covered with a white linen cloth. The phosphoric infusions were now laid aside, but the use of the above-

mentioned medicine continued. The insolation was repeated twice a-day, for half an hour before and three-quarters of an hour after, dinner. The patient was not suffered to open his eye-lids directly after the insolation, but only an hour afterwards, and then only in a darkened, though not quite dark, room. After having proceeded thus for a fortnight, he found the iris to have acquired more power of motion, and the patient, at the same time, complained of an itching sensation in the afflicted eye, but could merely discern the motion of the hand before the same. Mr. Loebel continued the insolation, and had the satisfaction of seeing his patient in a short time cured of his amaurosis. He could discern every object, and distinguish all his acquaintances that came to visit him: however he could not read any printed or written characters, nor could all Mr. Loebel's art bring his patient so far as to enable him to read a book with his right eye.

From subsequent foreign journals we make the following extract:—

A very ingenious oculist, Professor WEINHOLD, M. D. at Merseburg, has published the following remarks in recommendation of the use of Insolation upon the torpid Retina, in the Jena Literary News, Merseburg, Oct. 4, 1815.

“ I fully coincide in recommending insolation through *half-convex* glasses, having, in quality of practical physician and oculist, frequent occasions to observe the danger attending the use of the common burning glass. For this reason I commonly cause large burning glasses to be cut into halves, or cover them half with black paper, by which means the dangerous focus is avoided.

Insolation proved disadvantageous in the amauroses accompanied by a heightened irritability, but advantageous in that attended with torpor, or, as the ancients say, *sine materia*, of course, in the amaurosis the consequence of nervous complaints, unattended with gout, lues venerea, or psora.”

Flora of South Carolina and Georgia.

PROPOSALS have been issued in Charleston, (S. C.) for publishing, by subscription, a work on the Botany of South Carolina and Georgia, by Stephen Elliot, Esq. of Charleston. This

work will be published in numbers, which will not exceed ten. The first number will be published in May or June, and the subsequent numbers at intervals of two months each. The price to subscribers will be a dollar each number. The work will include all such plants as the author has seen himself, and also those which have been described by botanists on whose authority he can rely. It will contain, occasionally, observations on the medical and economical uses of the plants described, their popular names, where they can be ascertained, and some notices of the insects which they support, and by which they are destroyed.

The friends of natural history will anticipate with much pleasure the appearance of this work, which is to embrace the productions of a tract of country, exuberant in its vegetation, and highly interesting to botanists. The name of Mr. Elliott is not unknown to the scientific world, and high expectations may be placed on his able execution of the undertaking he has announced. His fondness and zeal for the science may be estimated from the following passage, which we extract from an address delivered before the Literary and Philosophical Society of South Carolina, of which he is president.

“The study of natural history,” says he, “has been for many years the occupation of my leisure moments; it is a merited tribute to say that it has lightened for me many a heavy, and smoothed many a rugged hour; that, beguiled by its charms, I have found no road rough or difficult, no journey tedious, no country desolate or barren. In solitude never solitary, in a desert never without employment; I have found it a relief from the languor of idleness, the pressure of business, and even the unavoidable calamities of life.”

Translation of Boyer's Surgery.

DR. STEVENS, professor of Surgery in the Medical Institution of New-York, has undertaken the task of translating the late work of Baron Boyer. This valuable publication is a treatise on surgical diseases, without the operations; for although the title might convey the idea of a work on operative surgery, the author disclaims a pretension to this, and refers to others,

for instruction in the use of the knife. It was originally published in four volumes; but the intention of the translator is to compress it into two. No other modern work, in our possession, enters so exactly into the details of surgical treatment: and although the author's minuteness may sometimes appear fatiguing, his patient description of the phenomena and treatment of this class of diseases assists us in a part of practice where others forsake us.—Dr. Stevens has published one volume of his translation, containing two of Boyer's.

DR. WILSON of New-Hampshire has lately published "An Inquiry into the Nature and Treatment of the prevailing Epidemic called Spotted Fever." This volume contains about 200 pages, and is divided into three parts. The first part contains a general view of the climate and diseases of the United States. The second is an inquiry into the nature of this epidemic. The third comprises the treatment.

Gum Kino.

IN the appendix to the life and last journal of Mungo Park, lately published, it appears that this drug, whose origin has hitherto been unknown, is found, from a specimen sent by him to Europe, to be obtained from a species of *Pterocarpus*, not yet described by any botanical writer.

DR. GRANVILLE has nearly ready for publication, a translation of that part of Orfila's general Toxicology which more particularly relates to poisons from the vegetable and animal kingdoms. The subject having formed a very immediate branch of Doctor Granville's scientific pursuits, he has been enabled to accomplish his translation with copious notes and additions.

DR. ADAMS is preparing for the press, Memoirs of the Life, Doctrines, and Opinions of the late JOHN HUNTER, founder of the Hunterian Museum, at the College of Surgeons in London. These Memoirs are carefully collected from authentic documents and anecdotes, and also from the writings, lectures, and conversations of the deceased.

College of Physicians of Philadelphia.

JULY 2d, 1816.

The following officers of the College were this day duly elected.

President.

Doctor Adam Kuhn.

Vice President.

Doctor Thomas Parke.

Censors.

Doctor Caspar Wistar,
Samuel P. Griffitts,
William Currie,
Thomas T. Hewson.

Treasurer.

Doctor Thomas C. James.

Secretary.

Doctor Joseph Parrish.

PENNSYLVANIA HOSPITAL.

Patients remaining in the house April 22, 1815	-	146	
admitted from that time to April 27, 1816		681	
			827
Of these the number Cured is	-	-	397
Relieved	-		72
Removed	-	-	56
Children born in the house			11
Eloped	-	-	37
Died	-	-	66
Remain	-	-	188
			827
<i>Out-Patients.</i>			
Cured	-	-	891
Relieved	-	-	39
Disorderly	-	-	30
Delivered	-	-	2
Died	-	-	138
Remain	-	-	132
			1132

PENNSYLVANIA HOSPITAL.

MAY 13th, 1816.

The following Physicians were chosen for the ensuing twelve months:

Doctors Thomas Parke,
P. S. Physick,
John Syng Dorsey,
Joseph Hartshorne,
John C. Otto,
Samuel Calhoun.

For the Lying-in Department,
Dr. Thomas C. James.

For Out-Patients,
Dr. John W. Moore.

JUNE 24.—Dr. Joseph Parrish was elected physician to the Pennsylvania Hospital, in the place of Dr. Physick, resigned.

UNIVERSITY OF PENNSYLVANIA.

MAY 11th, 1816.

AT an extra-commencement held this day, the degree of Doctor of Medicine was conferred on DANIEL DRAKE, of Cincinnati, in the state of Ohio.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia during the first six months of 1816.

JANUARY.

Thermometer—Lowest, at 8 A. M. 6. 15th of the month.
 Highest, at 3 P. M. 46. 23d.
 Mean, 30.

Winds—northerly and westerly—Delaware frozen on the 9th, and broke up on the 24th—several snows.

FEBRUARY.

Thermometer—Lowest, at 8 A. M. 8. 9th and 15th days of the month.
 Highest, at 3 P. M. 58. 4th.
 Mean, 32.

Winds—southerly and westerly, for the most part—not much rain—no snow—a mild month.—A severe earthquake on the second inst. about one o'clock P. M. at Lisbon, and one early in the morning of the same day at Madeira—duration from 3 to 4 minutes at each place.

MARCH.

Thermometer—Lowest, at 8 A. M. 14. 8th day of the month.
 Highest, at 3 P. M. 70. 27th.
 Mean, 40.

Winds—variable—chiefly northerly and westerly.—Three or four snows this month; little rain.—Ice-islands met with off the coast on the 31st.—Earthquake in England on the 17th.

APRIL.

Thermometer—Lowest, at 8 A. M. 33. 16th day of the month.
 Highest, at 3 P. M. 75. 27th and 29th.
 Mean, 45.

Winds—westerly winds prevailed—the last three weeks of the month dry.—Ice in the gutters on the 16th.—The newspapers of this month mention the existence of the plague at Naples.—Spots in the sun appeared in this and the following month.

MAY.

Thermometer—Lowest, at 8 A. M. 38. 16th day of the month.
Highest, at 3 P. M. 76. 22d and 31st.
Mean, 58.

Winds—westerly most prevalent—an uncommonly dry, cool month—some snow on the 24th.—Shad large but not so plentiful as common.—Locusts in North and South Carolina, and in Georgia, in this and last month.—An earthquake on the first day of the month at New York.—The bank of the Mississippi gave way near New Orleans, and the city was inundated to an extensive degree.

JUNE.

Thermometer—Lowest, at 8 A. M. 50. 7th day of the month.
Highest, at 3 P. M. 90. 14th.
Mean, 70.

Winds variable—westerly and easterly most prevalent—weather alternately hot and cold—refreshing rains—some heavy thunder.—The coldness and dampness of the preceding months have been injurious to vegetation—but there is a prospect of a good harvest in many places—Fruit abundant—heavy snows in Vermont, Massachusetts and Canada.—Hæmoptoe unusually prevalent here in the beginning of the spring. Intermittents, of a common mild character, and acute rheumatism, frequent throughout the spring—Erysipelas uncommonly prevalent in May and June—small pox continues—measles and carlatina have occurred for some time past, though not to any considerable degree.

RECENT BRITISH PUBLICATIONS.

Medicine, Surgery, &c.

Lectures on Inflammation, exhibiting a view of the General Doctrines, pathological and practical, of Medical Surgery. By John Thomas, M.D. F.R.S.E. Professor of Surgery in the Royal College of Surgeons, &c.

An Essay on the Yellow Fever, with observations concerning Febrile Contagion, Typhus Fever, Dysentery and the Plague; partly delivered at the Gulstonian Lectures before the College of Physicians, in the years 1806 and 1807. By Edward Nathaniel Bancroft, M. D. Fellow of the Royal College of Physicians, &c.

Reports of the pestilential disorder of Andalusia which appeared at Cadiz, in the years 1800, 1804, 1810 and 1813, with a detailed account of that fatal epidemic, as it prevailed at Gibraltar, during the autumnal months of 1804, &c. By Sir James Fellowes, M.D. F.R.S.E. and Fellow of the Royal College of Physicians London, &c. &c.

A Practical and Historical Treatise of Consumptive Diseases, deduced from Original Observations, and collected from authors of all ages. By Thomas Young, M.D. F.R. and L.S. Fellow of the Royal College of Physicians, &c.

A Treatise on Forensic Medicine, or Medical Jurisprudence. By O. W. Parthy.

Elements of Pathology and Therapeutics; being the outlines of a work intended to ascertain the Nature, Causes and most efficacious modes of prevention and cure of the greater number of diseases incidental to the human frame; illustrated by numerous cases and dissections. By Caleb Hillier Parry, M.D. F.R.S. &c. Vol. I. General Pathology.

A critical Inquiry into the Pathology of Scrofula; in which the origin of that disease is accounted for on new principles; and a new and much improved method is recommended and explained for the treatment of it. By George Henning, M.D.

A correct Translation of the newly corrected Pharmacopœia, of the London College of Physicians. By Richard Reece, M.D.

An Inquiry into the Causes of the Motion of the Blood, with an appendix; &c. By James Carson, M.D. &c.

A General System of Toxicology, or a Treatise on Poisons, &c. By M. P. Orfila, M.D. of the faculty of Paris, Professor of Chemistry, &c.

Observations on the Cure of Cancer, &c. By the late Thomas Denman, M.D. &c.

Medico-Chirurgical Transactions, Vol. VI.

Medical Transactions of the College of Physicians London, Vol. V.

An Epitome of Juridical, or Forensic Medicine. By Dr. G. E. Male, of Birmingham, 8vo.

An Inquiry into the Nature, Cause and Varieties of the Arterial pulse. By Dr. C. H. Parry, of Bath.

Three Lectures on Craniological Physiognomy, in which the opinions of Drs. Gall and Spurzheim are controverted; in one Vol. 8vo. with Engravings.

Natural History and Botany.

Flora Londinensis, by the late William Curtis; enlarged and continued by George Graves, F.L.S. and William Jackson Hooker, F.R. and L.S. Royal folio, Part I. to VI.

A Treatise on the Nature, Œconomy and Practical Management of Bees, &c. &c. By Robert Huish, of the Imperial Apiarian Society of Vienna.

A System of Physiological Botany. By the Rev. P. Keith, F.L.S. &c. 2 Vols. 8vo.

Transactions of the Geological Society, 4to. Vol. 2.

An Elementary Introduction to the Knowledge of Mineralogy, &c. By William Phillips.

Ovarium Britannicum. By George Graves, F. L. S. Part I. Royal 8vo.

Ornithology. By George Graves, F.L.S. 2 Vols. Royal 8vo.

Transactions of the Linnæan Society of London, Vol. XI.
Part II.

A Descriptive Catalogue of the British Specimens, deposited
in the Geological Collection of the Royal Institution. By
William Thomas Brande, F.R.S. 8vo.

Natural History of British Birds, &c. Vol. VI. and VII.

A Treatise on the Natural History, Properties and Use of
Coffee.

American Publication.

Lieutaud's Synopsis of the Universal Practice of Medicine.
Translated By Edwin A. Atlee, M.D. Fellow of the College
of Physicians of Philadelphia.

LITERARY INTELLIGENCE.

Edward Earle proposes to publish Park's Chemical Essays,
and Henry's Chemistry.

THE
ECLECTIC REPERTORY
AND
ANALYTICAL REVIEW.

VOL. VI.

OCTOBER, 1816.

No. IV.

SELECTED PAPERS.

Medical Topography of New-Orleans; with an Account of the principal Diseases that affected the Fleet and Army on the late Expedition against that City. Communicated by a NAVAL SURGEON.

“Ceterum antequam destinata componam, repetendum videtur qualis status urbis, quæ mens exercituum, quis habitus provinciarum; quid validum, quid ægrum fuerit; ut non modo casus eventusque rerum, qui plerumque fortuiti sunt, sed ratio etiam causæque noscantur.”—TACIT. *histor.*

[From the Edinburgh Medical and Surgical Journal, for April, 1816.]

EVERY lover of medical literature, and of medicine as an experimental science, must deeply regret, that, though the expeditions undertaken by Great Britain, within the last hundred years, have been both frequent and formidable, there has been such a poverty of professional communications, that a good medical history of the greater part of them is now, and ever must be, a *desideratum*. While the policy and execution of such armaments are discussed in hundreds of newspapers, and give birth to clamorous pamphlets without number; medical facts and observations, which, instead of a shifting and transitory interest, may be of permanent importance to

mankind, are allowed to float down the silent current of oblivion, till they are lost for ever. It is painful to reflect how much this supineness of professional men has cost our art, and how rich a tract, fertile with knowledge and improvements, has thus been given up, without resistance, to the inundations of the river *Lethe*; whose waters (in this instance it may be said without epigrammatic quaintness) have preserved straws and trifles, while things of specific and sterling weight have sunk to the bottom without a hope of recovery.

In the late expedition against New-Orleans, what from the sword and from disease, there was such a loss of human life, as must cause the mere politician regret, and the philanthropist affliction. Such being the case, it will not, I hope, be considered as presumption in me, to attempt some account of the complaints that occurred; an attempt which, however feeble, may in some degree compensate for the want of a better. I could, indeed, have wished that some one of greater talents, and with better means of official information than myself, had executed this undertaking, and would now willingly lay aside my pen in expectation of such an event, did I not recollect that, by every individual's thus shuffling off the task of description from himself, in the vague hope that it may be performed by another, that very detriment to medical science has arisen, of which I have just complained.

New-Orleans is situated in 30 degrees of north latitude, and 90 of longitude west from London. It stands on the left bank of the Mississippi, about 100 miles from its mouth, and may justly be regarded as the Capital of this district of the New World, from its commerce, its opulence, and its population. It is the great emporium into which the scattered inhabitants of the upper country, and the surrounding desert, pour their cotton and their skins, receiving in return many of the necessities of life, and some of the luxuries of refinement.

The river Mississippi forms a most august feature in the physiognomy of this country. While the majestic grandeur of its stream, and its *unexampled* length of course, excite the admiration of the naturalist, and its subserviency to the purposes of commerce claims the attention of the merchant, it is

no less interesting to the medical philosopher, from the direct and conspicuous influence which the distribution of its waters has upon the soil and health of the country around its mouth. This magnificent river has its source in the remote and almost unknown regions of the American continent. Slender in its origin, the infant flood is interrupted by mountains, and broken by cataracts, until it receives the proudly independent (rather than tributary) streams of the Missouri, the Illinois, and the Ohio, when it rushes irresistibly forward to the ocean, with a current both broad and deep. Pursuing its course with innumerable sinuosities, through fertile meadows, over whose vast extent the tired eye cannot stretch,—through sequestered regions where nature has no one to witness her awful mysteries, and through the gloom of forests coeval with the creation, it at last, after a course of *three thousand miles*, pours, by several mouths, the mass of its weary waters into the gulf of Mexico.

The country around New-Orleans is a perfect plain, frequently intersected by the outlets of the river, and not unfrequently, during winter and spring, watered by its inundations. Indeed, the city itself is built upon what may be called a *Delta*, formed by this *Nile* of the Western World. In a country of this description, it will easily be conceived, that marshes are very numerous and extensive; in fact, the whole country, especially in winter, is a continued marsh, with merely solid patches (very fertile indeed) here and there. The few roads, and the site of the different forts, are generally *made-ground*.

Even the ground on which the city stands, bears evident marks of comparatively recent formation; for, on digging a few feet under the surface, abundance of water, soft mud, and trunks of trees are met with. These last have no doubt been flooded down, and stranded by the current, where receiving hourly reinforcements of vegetable rubbish, the whole has been bound into one immoveable mass by the viscid mud of the river.

The climate, too, of New-Orleans, must not be overlooked, as its peculiarity, co-operating with the above-mentioned distribution of the Mississippi and the condition of the soil, is

the real and only cause of those formidable diseases to which this city and its vicinity are subject. It is one of the anomalies of the New World, not yet very satisfactorily accounted for, that the intensity of the heat in summer, and of the cold in winter, is much greater than in the Old World, on the same parallels of latitude. This difference is very obvious all along the eastern shores of the American continent, but no where is it so striking as at New-Orleans. From the end of November till the end of March, the weather is generally cold and rainy, with frequent hard frosts. At those times the thermometer ranges from 20° to 40° in the shade; and there are instances, I am told, even in so low a latitude as 29° north, where, in the night, it is only a few degrees above Zero. On the contrary, during summer this climate has all the characteristics of the torrid zone; the thermometer stands at 87° or 90° in the shade. At New-Orleans, especially, the weather is close and suffocating, from its distance from the sea, and, consequently, the entire absence of that inestimable luxury of a tropical climate, the *sea-breeze*; from the air being loaded with watery vapours; and from the smell of the mud of the river and swamps, which is often, even in winter, very sensibly offensive.

The description here given of the climate and soil of New-Orleans will apply, almost without alteration, to the contiguous district of the Floridas. In the former, indeed, there are traces of human care and refinement; but, in the latter, Nature still pours forth her gifts in solitary and unprofitable exuberance. Never did I see a shore more inauspicious and uninviting. The whole country is a dreary flat, indented with stagnant creeks, salt-water lagoons, and muddy rivers, whose waters are concealed by the darkness of endless woods, that approach to the very brink of the sea, as if envious of its dominion. Here there is no variety,—no eminence to relieve the eye while wandering over the insipid level of dingy green,—not a single appeal to human feelings,—not one object to call forth those mixed undefined associations of interesting simplicity, domestic content, happy industry, and cheerful civilization, which constitute the charm of the rural landscape in

Europe. On the contrary, the whole scene suggests vague impressions of solitary terror, and savage wildness, and presses home upon the heart the chilling ideas of dereliction and desolation.*

The local peculiarities in the climate and soil of New-Orleans give rise, during winter, to epidemic dysentery, and, in summer, to marsh fevers of a very rapid and dangerous form, from which the inhabitants, but particularly strangers, suffer most severely. The occurrence of such complaints, some readers, from the above detail, will be prepared to expect as a *necessary* consequence. Lest others, however, should be sceptical, it shall be my business, by and bye, to make this preliminary picture of the medical topography of the country subservient to discussions of higher interest, and to prove, by facts, the reasonableness of opinions.

"Hoc opus exiguum vario sermone levemus:

Perque vices aliquid, quod tempora longa videri

Non sinat, in medium vacuas referamus ad aures."—OVID. *Metam.*

About the middle of November 1814, the expeditionary force destined to act against New-Orleans, arrived at Jamaica, under the command of Vice-Admiral the Honourable Sir Alexander Cochrane. That island had been pitched upon as the pivot of extensive military operations against the southern shores of the United States; and the whole fleet of ships of war and transports having rendezvoused there, took their departure from Negril Bay, at the west end of the island, about the end of November, full of health and hope.

Before the middle of December, the fleet arrived on the coast of Florida, and took steps for disembarking the troops without delay,—a measure against which Nature seemed to have opposed ample and almost unsurmountable obstacles. It

* I am sorry that my account of this district is so entirely opposite to the published opinions of the venerable traveller, M. Chateaubriand. In hyperbolic raptures, and in the very pith of sentimentality, has this amiable enthusiast declaimed about "the oaks of Florida,"—"the spirit of the desert,"—"the pleasures of an Indian camp,"—and all the delightful et cæteras of a savage life!!—'Tis indeed passing strange. But, "De Gustibus," &c.

would have been desirable for the fleet to have proceeded up the main channel of the Mississippi, by which an approach to the town would have been secured; but, besides lesser shoals, its mouth was secured by a bar, having only 10 feet water, over which none of the frigates, and very few of the transports, could pass, however lightened. Besides, at that season of the year, the river being swollen with rains, the current was running strong down. Its tortuous course, too, would have required a great variety of winds to make good the passage of an hundred miles up; and its principal *detours* and elbows were defended by Port Plaquemaine, and other batteries of great strength.

This point of approach being out of the question, the fleet, passing betwixt two sandy uninhabited isles, in a very intricate navigation, made its way into the *gorge* of one of those broad salt-water lakes (considerably to the left of the river's mouth) that runs a length of way into the country, and embraces one of the minor outlets of the Mississippi. The water, however, was so uniformly shallow, that the frigates and transports grounded in the mud, at the distance of 70 miles from the nearest point of the Delta on which New-Orleans stands; and, consequently, all disembarkation was, of necessity, conducted at this disadvantageous distance. Moreover, the passage of this lake was obstructed by five large American smacks or gun-vessels, mounting several heavy guns each, and admirably adapted, from their build, for operating in those shallow waters.

The latter vexatious obstacle, however, was soon conquered by our sailors, who showed, on this occasion, all that "*as triplex*,"—that careless characteristic valour for which they are so illustrious. The boats of the fleet, manned and armed, were sent away, and, after a tiresome row of 36 hours, succeeded in penning the enemy up in a creek, where they attacked them against the superior odds of their position and their force; and, after a furious engagement, captured every one of them. This achievement was decidedly gallant, and would have stood amidst the most brilliant feats of naval warfare, had not the subsequent failure of the main object of the expedition thrown a bleak shade over its lustre.

The wounded on this occasion belonging to the different ships were not very numerous. The only thing I find worthy of commemoration was the rather unusual number of instances of tetanus supervening to the wounds, although the weather was dry, frosty, and apparently favourable to their healing. One case of marked tetanus, I understand, was successfully treated on the stimulating plan; but my information is not sufficiently precise to admit of particulars.

The landing of the troops was conducted by the boats of the ships of war and transports; but the distance was so great, and the weather so tempestuous, that it was the latter end of December ere the whole army was disembarked before New-Orleans. Even when this important object was achieved, there was little or no remission of toil to the sailors, for the army still required to be supplied with warlike stores, and fed from the fleet, at a distance of 70 miles.

About the beginning of January, 1815, bowel-complaints, which had previously appeared amongst the boats' crews and the fatigue-parties of the army, began to be very rife. They varied in degree of severity, from the milder symptoms of dysentery to its most aggravated forms. I may enumerate, in a few words, the symptoms of this disease. The patients, for the most part, complained of severe tormina, tenesmus, scanty bloody dejections, want of appetite and strength, *pains all over them*, and a disposition to vomit on taking either food or drink. The tongue was white or yellow; the eye languid; the pulse above 100, small, and easily compressed; the skin often dry, or covered with clammy sweat, but always considerably increased in temperature.

The causes were, generally speaking, obvious enough. The men had been rowing all day, and sleeping all night, in the open boats. They had incautiously drank the brackish water of the lakes, and had sometimes been obliged to eat their beef and pork raw, when, on an emergency, they were deprived of an opportunity of cooking it. They were often drenched with rain or with spray, without being able to put on dry clothes. Added to all this, the weather was extremely cold, particularly in the night, the thermometer before sun-rise being often

as low as 25 or 26 degrees, rising no higher during the day than 30 or 38 degrees, and seldom above 50°.*

The locality of the general rendezvous for the boats was very bad (though the best that can be found), being a miry place, covered with reeds, and abounding in miasmal exhalations.

The encampment of the army, too, was on a swampy spot on the left bank of the Mississippi, about six miles below New-Orleans. Indeed, the whole vicinity is a swamp, which, after the rains, so frequent at that season of the year, became a perfect puddle. Having the Mississippi on their left, they drank its discoloured and polluted water, and were exposed to the effluvium of its slimy mud, as well as to the paludal exhalations of an impracticable wooden morass on their right. The huts also in which the troops were sheltered were far from being impervious either to rain or cold; so that, upon the whole, the army and navy, in point of privations, were much upon a par.

On the first appearance of dysentery, its treatment was commenced by a flannel roller bound tight round the abdomen, and ordering flannel clothing next the skin, if the patients had it not already. Saline cathartics, or oleum ricini, with a few grains of calomel, were repeatedly given, until the stools were increased in quantity, and more freely rendered. At the same time, plentiful dilution, with tepid gruel, warm tea, rice-water (seasoned with sugar and *a little* wine), decoctions of lintseed or of gum-arabic, I always considered of primary importance.

When the primæ viæ had been fully evacuated, an attempt was made to restore the natural secretions, and open the pores of the skin. Antimonial powder, with opium, was employed for this purpose, but more generally the pulvis ipecacuanhæ compositus, which certainly seemed to succeed best.

* These observations of the thermometer are repeated from my own inspection. On this occasion the cold was so intense, that several of the boats' crews were incapacitated for some days, by pain and numbness of the lower extremities. Many soldiers of the negro regiments had their feet frost-bitten, and lost their toes by the consequent gangrene and sphacelus. Some of them even died in the camp, or in the boats, from excessive cold.

Whenever tormina and straining returned worse than ordinary, a cathartic was given in the morning, followed by a large dose of opium, or an anodyne diaphoretic at night.

By these means, aided by perfect quietude, repose, and low diet, the pyrexia soon disappeared, and nothing remained but debility and irregularity of the bowels, which were to be removed by the *mistur. cret. c. opio*, the *infus. quassiae excels.*, or the *mistur. cinchon.*, given thrice or four times a-day, and a gentle laxative once in three or four days.

Many of the earlier and milder cases yielded to this treatment, but those of a severer sort required measures less inert. In these malignant forms of the disease, I began by giving a strong saline or lubricating cathartic. Blood-letting also was practised when the patients were young and robust, or, indeed, whenever the force of the pulse and pyrexia seemed, on general principles, to justify it. I never saw cause to repent of this evacuation. Practised with prudence, it often moderated local pain of the abdomen, and did not perceptibly increase the subsequent debility. These preliminary steps being taken, I immediately commenced the use of *calomel*, and pushed on boldly to salivation, from the belief, which seems to be well founded, of an occult connection betwixt dysentery and a morbid condition of the liver.*

The doses I gave were regulated by the constitution of the patients, and the actual state of the symptoms; but one scruple night and morning was the most usual prescription, seldom less than ten grains thrice a-day. I have given a scruple night and morning so often, that I have long ceased to be at all anxious about hypercatharsis. It certainly seldom, in any case, increases the tormina and tenesmus, but generally lessens both very materially, and produces five or six large motions, voided with less straining, and less tinged with blood. I have in this

* A work has lately appeared, by Mr. Johnson, surgeon, Royal Navy, wherein this connection is earnestly maintained, and, I think, proved. Notwithstanding some assumed notions about the "Portal circle," rather hyperbolically extended, the work is really one of great ingenuity and utility. Perhaps its greatest fault is, the imposing air of novelty and exclusive improvement with which he promulgates his practice in dysentery,—a practice long known to his brethren in the navy who have served in tropical climates.

way given 16, 18, or 20 scruples of calomel in the course of half as many days, before the mouth became affected. When the gums were fairly sore, with some ptyalism, the calomel was omitted, the tormina and tenesmus disappeared as a matter of course, and the bowels gradually returned to their natural state. Some tonic or stomachic was prescribed during the days of convalescence; and, generally, as soon as the mouth was well the patients were fit for duty.

Calomel was often thus given alone and uncombined; but often I thought it preferable, on account of occasional symptoms, to conjoin with it two grains of opium, or to give at noon (in the interval betwixt the doses) twelve or fifteen grains of the Pulv. ipecac. compos. This was done to lessen the irritability of the bowels, and to support the cuticular discharge. Under such management, every case recovered where no *visceral obstructions* existed,* or where the coexistent disease of the liver was not irretrievable.

Opium is one of those remedies of doubtful utility in dysentery, which has been by some violently decried, and by others sparingly used, from its alleged tendency to check the natural secretions, especially that of the skin. Candour obliges me to say, that I have used it largely, and that I never noticed any of the unfavourable effects urged against it; but, on the contrary, can bear witness, with Dr. John Hunter, to its beneficial power. Given after purgatives, it can never be unsafe; and if it does no more, it procures a temporary truce from the disease. How important a cessation from suffering is in every illness, but more especially in so endless and harassing a complaint as dysentery, I need not say. Prejudices, probably illusory and theoretical, ought to give way to an advantage so solid.

Almost the whole body of the profession have concurred in praising injections in this disease. I of course defer to the

* This is a more frequent occurrence, even in our own climate, than, I believe, is generally expected; but, of those who have lived for any length of time within the tropics, it will be found, that *four-fifths* have one viscous or other in the abdomen, more or less altered by morbid action. This opinion is deduced from a very considerable number of dissections of such subjects.

experience of others, while I detail my own. Having found them almost uniformly hurtful, I entirely laid them aside. The irritation produced by introducing the pipe, more than counterbalances the soothing effects of the injection. Besides the unpalatableness of this species of remedy to the good old English habits of delicacy, I have always seen that, were the enema ever so bland, or ever so small in volume, it could not be retained beyond a very few minutes, and always occasioned more straining and tenesmus in the sequel. As a commodious substitute for injections, I have directed patients to insinuate into the anus a *small* crumb or two of opium, softened betwixt their fingers for the purpose; or have caused warm fomentations to be used to the parts, and bladders of hot water to be applied to the hypogastric region. These are wont to succeed so well, that the patients speak in strong terms of the relief afforded.

The advanced guard of the army was disembarked on the 24th of December, and took up a position on the *only* road to New-Orleans, there to wait the landing of the remainder. This body was fired upon, in the night, by an armed vessel from the river (which had dropped down with the current after dark), and by the American army on their right and front. With such unequal numbers, the conflict was obstinate, but very glorious to our troops, who put the enemy to the rout, and drove them "*l'epée dans les reins*," a considerable distance along the road. There is little doubt, but that for the profound darkness, and the small number of our troops yet landed, the Americans, in their confused flight, would have been followed into New-Orleans, and the town thus taken by a *coup-de-main*.

Instructed by this sharp and unexpected lesson, the enemy forthwith turned his attention to strengthen his commanding position, at a *narrow* part of the road, and every hour rendered it more formidable.

Meanwhile, our whole force had landed, but could not advance till batteries had been erected to destroy the armed ves-

sel, whose fire raked the left bank of the river, and flanked any forward movement of the troops. When this desirable object was accomplished, an attempt was made to cannonade the enemy's works, but it did not succeed.

At last the fatal morning of the 8th of January arrived. Before day-light, the whole of our army advanced in columns to storm the American lines;

“Quis cladem illius noctis, quis funera fando
Explicit? aut possit lachrymis æquare labores.”—VIRGIL, *Æneid*.

The works were defended by a broad ditch filled with water, as also a palisade, and a wall mounted with numerous pieces of cannon. The enemy, apprised of our intended invasion, had drawn these lines quite across the only road to New-Orleans. They were absolutely inaccessible at their flanks, as their right touched the Mississippi, and their left rested on an impassable wood and morass. This was the spot which the laws of Nature, as well as the rules of art, had concurred to strengthen; this was the strait which the Americans would fain compare to the immortal pass of Thermopylæ.

The attempt to storm failed. In this instance “fortune did *not* favour the brave;” our columns were beat back at every point with a loss, I believe, of more than five hundred killed, and fully twelve hundred wounded!

The main object of the expedition having thus failed of success, the troops were once more collected on board the fleet, and proceeded off Mobile river, to attack the town of that name. Fort Bowyer, which defends the harbour's mouth, being quickly and regularly invested, was captured on the 11th of February; but the ulterior operations were suspended by the arrival from England of the news of the peace of Ghent. The troops were disembarked on a sandy uninhabited spot, called *Dauphin* island, there to await the ratification of the treaty, and the arrival of such supplies of provisions as would enable them to prosecute the voyage homeward.

It is worthy of remark, that, notwithstanding the almost unexampled fatigues and privations of all sorts to which the army and navy had been exposed while before New-Orleans,

sickness of any kind, up to the 8th of January, had made comparatively little progress amongst them. The bowel-complaints, though numerous, were for the most part easily removed; and no other disease of any consequence prevailed. It is a remarkable fact, in the medical history of fleets and armies, that, during the fatigues and sufferings of a hot campaign, or the active progress of warlike operations, the men are very little subject to illness of any sort; as if the elation of hope, and the other great passions with which they are agitated, had the virtue to steel the constitution against the most powerful causes of disease. This circumstance, no less curious than true, proudly proves the ætherial origin of our nature, and goes far to assert the omnipotence of mind over matter. No sooner, however, does a great failure, and the dejection it draws after it,—a cessation of operation, and a return to the “*vita mollis*,” allow the spirit of enterprise to flag, than the previous fatigues and exposures begin to tell upon the constitution by their usual results—*disease*. Like a machine wound up beyond its pitch,—the excitement of accumulated motives once withdrawn,—the human frame rapidly runs down, and yields with a facility almost as unexpected as its former resistance. Hence, after a campaign, diseases of all sorts are prone to a type of debility and aggravation, and the proportion of deaths is unusually numerous.

Accordingly, in the instance before us, the pressure of ill success began to be severely felt after the failure of the 8th, and the consequent reimbarcation of the army. By this time unremitted fatigues, poor living, and that at short allowance, with the total want of fresh beef and succulent vegetables, not only altered for the worse the character of the bowel-complaints, and produced a fatal relapse in some recently cured, but also introduced scurvy, with its multifarious train of perplexing symptoms. Exposure to marsh miasmata, also, produced many cases of intermittent fever. By this time, too, the weather was getting warmer (the thermometer generally ranging from 60 to 70 degrees), accompanied with more sudden vicissitudes, and a greater proportion of rain.

Dysentery now put on that exasperated form in which it

has so often scourged our camps and fleets; and never shall I forget the terrible force of this invisible enemy. In all cases it was a very baffling untractable disease, but in those who had previously served long in warm climates, and whose livers were thereby affected, it was almost uniformly mortal. When the disease attacked such persons, it was a subject of melancholy but curious speculation to witness the headlong course of the disease, and how unavailing any species of treatment invariably proved. It knew neither pause nor hindrance, but like the fabled vulture of *Prometheus*, pursued its cruel task from day to day. Dissection always brought to light extensive visceral obstructions, particularly chronic inflammation, or abscess of the liver, with or without enlargement.

Nothing but experience can convey adequate ideas of the ungovernable nature of this disease, or of the insidious masked approaches of its attack. Days of an indisposition, apparently trivial, sometimes occurred ere the peculiar symptoms of dysentery showed themselves; at other times, pyrexia, high or slight,* and occasionally pain in the right side, obtuse or acute, followed by frequent copious dark green stools, (like *boiled spinage chopt*), slightly tinged with blood, were the form of the disease.

Griping was little complained of. There was merely a sense of weight in the hypogastric region, and a copious *flux* of green or dark-coloured sordes, voided without straining. The tongue was covered with a yellow fur, which, in the advanced stage of the disease, became thick, dark, and immoveable, as a slab of black marble. The pulse was sharp, but weak; frequent retching and hiccup attended; and a sensation, as if all the drink swallowed, hot or cold, ran speedily through the intestines. Oftener the complaint would make its attack with

* I may observe, that I never had the slightest reason to believe the disease itself, or its attendant pyrexia, to be at all contagious. I may also remark *here*, though I anticipate the course of the narrative, that in April and May, when the weather became hot, the character of the prevailing dysentery was rather exasperated by it; unlike the dysentery of cold climates, which is generally rendered milder, if not extinguished, by atmospheric heat.

the common introductory symptoms, and no pain in the right hypochondrium was felt throughout the disease, either on inspiration, or strong pressure beneath the ribs. Under whatever garb of disguise it made its appearance, disease of the liver (as I have before stated), and consequently a vitiated state of its secretions, were undoubtedly the primary cause of the mischief. Dissection of the fatal cases showed structural derangement, and generally suppuration of that viscus. I have often found two separate abscesses in the central part of its large lobe, containing in some instances a pint of pus, similar in colour and consistence to what is usually found in psoas abscesses.

On the villous coats of the colon and rectum, there were numerous excoriated points, with small superficial ulcers here and there, like the sequelæ of erythematous inflammation; but there were no morbid alterations sufficient to account for death; no ravages of gangrene, &c. like those related by Sir John Pringle and others, in their accounts of this malady.

In short, to give a condensed view of the whole matter, the phenomena of the cases that recovered, as well as the morbid appearances of those that died, impressed upon my mind a conviction, that the diseased condition of the liver was the soil from which dysentery drew its malignant growth, strength, and nurture. This was the "*fons et origo mali*;" by it the dysentery was excited, and only by *its* removal could it be removed. This double detriment—this *Janus-like* aspect of the disease, I rather think, is new to many of the profession, but I trust it will soon be widely known and acknowledged. I hope the time is not far distant, when, instead of viewing dysentery as an idiopathic disease, and tracing its seat to the colon and rectum, medical men will regard it merely as secondary to, and symptomatic of hepatic affection, and will seek its cause in a morbid condition of that important gland.* Whatever may be the *mode* of connection be-

* It seems to be one of the errors of modern medicine, to overlook in practice the liver and spleen, merely because the necessity of their functions is not so obvious and immediate as that of some other organs. That a gland so large and of such unexampled vascular structure as the liver, should have

tween hepatitis and dysentery, I have no doubt that, at least in tropical climates, they are connected like cause and effect. I am *unwilling* to offer any hypothesis on this subject, purely because I am *unable*; this I confess, for I shall never chime in with that tone of affected contempt for all theories, in which presumptuous dulness so often shelters its imbecility. Those who indulge this disgusting oft-repeated cant, ("crambe bis millies cocta,") ought to be reminded, that not merely in medicine, but in all other sciences, few brilliant discoveries have been made, except by those acute and industrious men that were shapening and toiling at some untractable theory. However much all their diligence might fall short of the results they themselves fondly expected, still so much digging and delving often turned up very valuable ore, and always left the soil in a fitter state for the future labourers in the great field of improvement.

To return to the subject under consideration, I can readily conceive, that, from disease of any gland, the fluid it secretes may acquire acrimonious properties, sufficient to injure the fabric of the passages through which it is destined to pass.

much occult influence in all diseases, might, from the mere reason of the thing, be supposed. Its secretions influence the state of the stomach, and are influenced in their turn by the passions of the mind; and many facts would lead us to believe that there is a hitherto undescribed sympathy betwixt *this* viscus and the *brain*. I am informed, from a gentleman who has practised long in India, that patients have been suddenly seized with amenia, rigors, delirium, and syncope, speedily followed by death; and that, on dissection, abscess of the liver was the only perceptible cause of such symptoms.

The depressing passions I have seen to have a striking effect on the biliary secretion, and even to induce cholera; whereas anger, like intoxication, when habitually indulged, gives rise to chronic enlargement and obstruction of the liver. In short, the functions and sympathies of this gland, which were deservedly of so high account with the ancients, seem to be insufficiently studied by modern physicians.

Horace, in the following lines, instead of a popular or poetical tenet, has probably expressed a curious and unexpected pathological fact.

"————— Væ, meum

Fervens difficili bile tumet jecur.

Tunc nec mens mihi, nec color

Certâ sede manet.——HORAT. *Carm.*

We generally observe in dyspeptic complaints, or after a period of constipation, when the bile, from *remora* in the bowels, becomes morbid in quantity or quality, either that a spontaneous diarrhœa comes on, or, after a brisk cathartic has been exhibited, that the dislodged bile excites a sensation in the rectum, as if *boiling lead* were voided. When the state of the liver is still more morbid, may not the bile acquire the property of exciting *flux*, and of excoriating and ulcerating the villous coat of the colon and rectum?

These speculations I present with the greatest diffidence; and certainly do not wish to amalgamate them with the *facts* above recorded, which I pledge myself to have observed diligently, and reported faithfully. The latter are Nature's work, and, *as such*, will be confirmed by future experience: the former are matter of conjecture and personal opinion, which may stand or fall at the reader's pleasure; for, as Cicero well observes, "*Opinionum commenta delet dies, naturæ judicia confirmat.*"

Whether, therefore, the ratio symptomatum just given approach to nature's actual steps, I know not; but it is certain, that the practice which most readily removes the disease seems to countenance the above mode of reasoning. The *mercurial method* I have pushed to a great extent, and its results have been such as to give it a very decided preference, in my estimation. Calomel, that great specific in obstructions of the liver, given in large doses (generally one scruple twice a-day), combined with opium, to cause it to be retained in the system, corrects the condition of the liver, prompts healthy secretion, and resolves pyrexia; as soon as ptyalism takes place, the dysenteric symptoms disappear, and the appetite gradually returns. Upon the whole, my own experience, as well as that of some others that served in this fleet and army, warrants a far more certain expectation from this mode of treatment than from the alternation of purgatives with astringents, or any other heretofore in use.*

* I shall here mention a fact which may be regarded as the *experimentum crucis*, decisive of the rival merits of the two methods of treatment. The ship in which I am employed remained in the Gulf of Mexico after all the

Though mercury had, in this manner, such commanding influence over the disease, still experience here was not always uniform, for there were several vexatious instances where it failed. I do not speak of the fatal cases (for in them neither laxatives, astringents, fomentations, blisters, opiates, mercurial frictions on the abdomen, nor calomel pushed to salivation, ever were able to keep off the unhappy event), but expressly of those few instances where the patients, after being apparently cured, relapsed without any evident cause (I may observe, by the way, that relapses are more frequent, and more generally fatal, in this disease than in any other), or where ptyalism mitigated the symptoms somewhat, perhaps even suspended the disease entirely, until the mouth was well, and then it returned with much of its pristine violence. The disease thus ran into the chronic form, and harassed the patient for weeks, or even months, with the various symptoms arising from a weak irritable condition of the *primæ viæ*, irregular hepatic secretion, and imperfect formation of the chyme. The chief of these symptoms were, vomiting after meals, night-sweats, febricula, watching, pains in the lower

rest of our force had retired. From the large expenditure of calomel, I at last had none left, and there was not a grain to be procured. At this time I had several cases of dysentery, which, from necessity, I was obliged to treat, for several days, on the *old* plan, by neutral salts, or *oleum ricini*, alternated with anodyne sudorifics, *mistur. cretac. rhubarb*, diluents, &c. &c. One case was, indeed, of so bad a type, that I had made up my mind for its ending fatally. Luckily, however, our arrival at the Havannah enabled me to procure a supply of good calomel; and I immediately commenced with ten-grain doses thrice a-day. *Next morning* the patient was better; had passed a tolerable night; had less tormina and tenesmus, and a cleaner tongue. I increased the dose to one scruple night and morning, and thenceforth his improvement was perceptible from day to day. The pyrexia soon abated, and, in ten days, his dejections, from being green and fetid, had recovered the natural yellow colour, or nearly so. No complaint remained but a sore mouth. The patient is now living, and likely to live, a witness to the superior efficacy of this mode of treatment. The above is merely one of many instances where I have seen calomel work rapidly, and like a *charm*.

As a proof with how little apprehension calomel may be given to persons of all ages, I may state, that, to a boy of 14, *one hundred and fifty-two* grains were given, during the acute stage of a most dangerous attack of dysentery, before his mouth became fairly sore!! He fully recovered.

belly, occasional tenesmus, frequent costiveness, followed by spontaneous diarrhœa and discharges of blood, attended with frequent prolapsus ani and difficult micturition.

In conducting the cure, very delicate management was requisite; in fact the disease required rather to be led than driven. A regulated diet, and the use of flannel next the skin, were of the highest consequence. At the same time, the patient was put under a gentle and gradual course of calomel, taking two or three grains morning and evening, and rubbing in a portion of mercurial ointment on the belly and right side. Laxatives and astringents were employed occasionally, but, above all, the greatest use was made of opium, both internally and locally, *per anum*, and it really effected most conspicuous benefit. Sulphate of zinc I now and then tried, but from the nausea which it excited, even in three-grain pills, morning and evening, and from its apparent inefficacy in the disease, I should scarcely, in future, be tempted to give it farther trials. The tonic power of Peruvian bark was very useful both as an astringent to the bowels and as a restorative to the whole system. When the mouth was recovered from the first gentle mercurial course, if the complaint had not yielded, I did not hesitate to use calomel again in the same gradual manner, till the gums were slightly affected, and then gave tonics as before. This assiduous perseverance, and the patient attention which it implied, I am happy to say, were well rewarded. Many patients were thus recovered from a state, not hopeless indeed, but very precarious, and were re-established in firm health.

I have been thus minute on the subject of dysentery, seeing it was the principal disease by which we suffered. The practice above detailed was not merely my own, but was pursued, though perhaps with minute variations, by most of the medical officers of my acquaintance on this expedition.

I have before mentioned, that, besides dysentery, many cases of intermittent fever and scurvy occurred; in truth, the latter diathesis was often very conspicuous in the patients affected with dysentery. Of the intermittents I need not speak, as nothing remarkable took place in their symptoms, and they were all easily cured by the usual means. Of scurvy, however,

from the great number of the cases, and the fatality of some of them, it is necessary that I should give some account. Besides the customary symptoms of livid blotches, bleeding gums, and a slow healing of the small cuts or scratches accidentally inflicted, phlegmonic inflammation and suppuration sometimes occurred spontaneously on the leg, followed, when the abscess burst or was opened, by sphacelation of the cellular substance. Often, too, trivial sores would change, in a night, and take on ulcerative action, with extensive sloughing of the integuments and muscles, and a most profuse ill-conditioned discharge. When the mere loss of parts was so considerable as to render it impossible to save the limb, and the resource of amputation was called for, the case did not often end well; for the stump, after doing apparently well, degenerated without any evident cause, and was seized with sloughing, a black thin fetid discharge, and a general melting away of the muscles, until they were insufficient to cover the bone. Hectic fever and exhaustion gave the patient his last release.

In this formidable complaint, which may be denominated "sloughing scorbutic ulcer," many remedies were employed, both internally and externally. The internal ones were lime-juice, bark-mixture, and mineral acid; but it would appear that the former, though adequate to correct a mere proclivity to scurvy, has little or no power in these more advanced and serious states of the disease. In fact, it was not to be so corrected; it was not merely vegetable acid, but esculent vegetables, fruits, refreshments, and repose, that were necessary. It was purely from the want of these that the people had suffered; for neither crowding, impure air, nor filth, had any existence in situations where this form of scurvy often appeared.

Equal parts of basilicon and oil of turpentine (melted and applied warm to the ulcer), mixtures of lime-juice, or rum and water, charcoal cataplasms, common poultices, bark decoctions, or bark in powder, were employed as outward applications to a sore; but though they kept it cleaner, they were often of no avail to arrest the sloughing process. A solution of *two drachms* of *alum*, in about a *quart* of water, was, upon the whole, an admirable local remedy, and seemed to possess

wonderful powers in stopping the ravages of sphacelus, and giving a healing tendency to spreading ulcers. For the knowledge of this application, which is not more simple than efficacious, I am indebted to the liberality of Mr. Boyd, surgeon of the Gorgon Hospital-ship, a gentleman of uncommon ability and experience in every department of the profession.*

The detail of this season of peril and pressure closes here. It commenced about the middle of January, and its painful duration was upwards of two months. During the last week of March and first week of April, the main part of the expedition finally left those shores; therefore the observations I am about to make on fever, apply less to the armament in general, than to the force (chiefly naval) that was obliged to remain in the gulf of Mexico for several weeks after the rest had proceeded home.

The frosts and cold rains which had lately prevailed on this coast were now at an end, and the weather rapidly mounted to the average standard of the torrid zone. During April and May, the thermometer was never below 80 degrees, and often indeed rose much higher. This greatly augmented temperature soon began to tell on the people, and gave rise to many cases of cholera and of ardent fever,—the latter entirely confined to those who had previously been serving on shore, or exposed much to the sun and night-dews while pulling in boats on the coast, or in the river of Apalachicola. Of the former disease, not one instance, so far as I know, proved fatal. Large doses of calomel, with opium, and plenty of mild diluents, constituted the whole of the treatment. In ardent fever, however, the success, though great, was by no means so uniform.

Of the treatment I come now to speak. Regarding this disease to be, to all *practical* intents and purposes, inflammatory, and the affection of the head to be primary and essential; which is evinced by headach, intolerantia lucis, and red eyes, occurring as the earliest symptoms (for the eye is here an index of the state of the brain, in the same manner as the tongue

* I trust Mr. B. will excuse this unauthorized citation of his name and authority.

is of the state of the stomach), I have never hesitated to push evacuations to the utmost. Bleeding from the arm or frontal branch of the temporal artery, was always my first step; and large and repeated bleeding during the early stage (the earlier the better) I consider the great palladium of the patient's safety. One cannot tell how many ounces ought to be taken; we ought to bleed to syncope, to break the morbid association of the symptoms, and induce a speedy remission; for I am convinced, that it is less by its unloading the vessels, than by the *shock* (I cannot express it in philosophical language) which it gives to the whole system, nervous as well as vascular, that blood-letting affords the magical relief I have so often witnessed. It is also by the inexplicable changes implied in the word *shock*, that cold affusion operates advantageously; for, in tropical climates, where the temperature of *sea-water* is generally from 80 to 82 degrees, its refrigerating power must be much abated.

The state of the pulse is less to be regarded than the urgency of the other symptoms; even when the former is thready or undulating, the latter often imperiously demand renewed depletion; and their demand must be complied with at all hazards. In a disease like this, where the danger is frequently imminent in twelve or twenty-four hours, it is amazing how much its apparent character may be altered by active depletion. From a fever of the highest grade, management will change its complexion to one of the second or third order. To secure every chance of such success, no attention must be spared; the patient ought to be seen every two hours; and, whenever the febrile symptoms get up anew, new exertions must forthwith be made to subdue them.

It is an Herculean disease, and, without that almost omnipotent remedy, the lancet, we might be said to encounter it unarmed; for all other means are but of secondary force. It requires all the vigour and activity imaginable, else it will gain ground on us with rapid strides. A practitioner who will not bleed largely in the onset, will soon feel himself in the melancholy predicament of the celebrated *Julian the Apos-*

state,* who was hurried into battle with an active and unrelenting enemy before he had buckled on his armour, or prepared himself for his defence. Like Julian, he will feel his vantageless condition when it is too late, and will pay dearly (if he has sensibility), or at least his patient will pay dearly, the forfeit of such neglect; for be it remembered, that, in medicine no less than in politics, “*Quicquid delirant reges, plectuntur Achivi.*”

In this disease, therefore, it is indispensable to bleed again and again:—It is the main stay,—the sheet-anchor of hope. Without it, many, very many must infallibly be lost;—would that I could say that by it *all* are saved! But when it is recollected how often inflammation, even of parts not vital, foils all our exertions at resolution, it cannot be wondered at, if blood-letting is often incompetent to remove inflammation of the brain or abdominal viscera, organs endowed with high sensibility, extensive sympathy, and functions whose right performance is essential to life.

I cannot undertake to go minutely into all the happy results† of this decisive practice; in fact, it is the less necessary for me to do so, as it obtains so generally amongst surgeons employed in the service of their country in tropical climates,

* For the death of Julian, and the manner of it, see the elegant narrative of *Ammian u Marcellinus* (Hist. Lib. xxx.), as also Mr. Gibbon’s interesting account.

† It is remarked that patients who have been ill of fever are apt afterwards to die of dysentery or chronic complaints. Though thirty-seven of the crew of the frigate to which I belong laboured under ardent fever on the Jamaica station, and though the ship afterwards suffered a good deal from dysentery in the Gulf of Mexico, none of the thirty survivors died of that or any other subsequent disease. It is therefore another praise of the depletory practice, that it leaves no visceral obstructions to be a source of after danger.

I shall here mention a farther indirect advantage arising from this method. In the early stage of ardent fever there is often a torpor of the bowels, which renders them insensible to the stimulus of purgatives. When bleeding is practised, either while the blood flows, or immediately after recovering from syncope, the cathartic previously given produces urgent calls to the seat and full purging. Venæsection certainly renders the body more susceptible of the action of blisters also.

and has become such a favourite method, that, instead of an unguarded hortatory tone, it would perhaps be well to put in a *caveat* against the abuse of this most potent remedy. Of such abuse, I cannot say I have seen any example; but some friends, on whose judgment I place great reliance, have informed me that they have occasionally witnessed detraction of blood pushed to an unseasonable and improper length. This I can well believe, having felt by experience, that the great difficulty in treating this fever is to say *when* active evacuations ought to be laid aside. The exact decision of this point requires considerable *tact*, and a previous acquaintance with successive phenomena of the disease.

Purging, free purging, I have not hitherto mentioned, its necessity being so much a matter of course. A stimulus ought to be kept up constantly on the bowels, if with no other view than to relieve the head. Blisters and the cold affusion I have found to be valuable auxiliary remedies:—I call the latter by the subordinate epithet of *auxiliary*, for to attempt (as some have fondly hoped) to extinguish this most violent fever by *it*, is like attempting to extinguish the crater of mount *Ætna* by water! It, however, reduces heat and invites sleep, and (what is of very great consequence) by its bracing power on the skin, it gives tone to the stomach, lessening nausea, and checking vomiting, a thing so much to be dreaded in every stage of this disease. With the latter view, also, I have found saline effervescing draughts, and small oft-repeated doses of calomel, highly useful.

These remedies are mentioned in succession according to their relative efficiency, but, in actual practice, their application must be contemporaneous. Bleeding, purging, cold lotions to the head, shaving the scalp, and general refrigeration by the cold bath, must be drawn up together in array against the disease, and must make a combined attack. A first or even a second disappointment must not rob us of our perseverance. Courage and constancy will in the end often succeed against great seeming odds. In short, the violent excitement must be got under by all means, ordinary and extraordinary.

I have never either tried or trusted to calomel as a *siala-*

gogue in this disease. The blind confidence in its supposed specific power has, I believe, nearly faded away before the better lights and the more speedy results which the depletory practice has afforded.* In ardent fever, where there is a morbid activity of the arterial, with a proportional inactivity (almost amounting to torpor) of the venous and absorbent systems, it is a matter of extreme uncertainty, whether mercurials can find their way into the system, until the paroxysm of fever is dissolved. Its action, even were it absorbed, would be rather hurtful, as favouring that depravation of the solids and solution of the fluids, which, with the effect, putrescency, are so much to be feared in the latter end of continued fevers. Upon the whole, longer time and trials have only given additional strength to the opinion which Dr. Saunders pronounced on the inutility of mercury in the endemial fevers of tropical countries.

In the cases that came under my care, I have been in the habit of giving three or four grains of calomel after the primary stage of fever, every three or four hours, with the view of deriving from the head and viscera, by keeping up a constant action on the intestinal canal, as also to carry off sordes, and to prevent vomiting. I preferred calomel, because, from the precarious state of the stomach, more bulky or more nauseous cathartics could not, in all likelihood, be retained. When low delirium, coma, torpor, or the like, occur, it may be desirable, as a last resource, to place the system under the influence of mercury; but, even under these circumstances (though the

* An attempt has lately been made to *clap up a match* betwixt the depletory and mercurial methods, and to call in the aid of both in the same case. The most respectable, if not the original proposer of this incongruous union, is Mr. Johnson, in his valuable work before referred to (see note, p. 429). What table of affinities suggested this coalition, it would be vain to conjecture.

However ingeniously devised this combined system may be, it will never stand. Like the famous image in the vision of the prophet Daniel, it is formed of repulsive materials: the *iron* and *clay* will not coalesce—cannot amalgamate,—but the baser matter will crumble to dust, leaving the other part to the enjoyment of proud perpetuity. The separation doubtless will be spontaneous, and the sooner it takes place the better.

mouth was fairly affected), I have never been so fortunate as to see it of any avail in saving life.

Much has been said about the prophylactic virtue of this mineral in warding off the attack of fever. No one will deny that a mercurial course, by lowering the tone of the constitution, lessens the liability to this as well as all other inflammatory diseases; but some cases in point have fallen under my care, where men have been suddenly attacked with severe symptoms of the endemic, whose systems, for a week before, had been saturated with mercury on account of a venereal complaint. I therefore suspect that the influence of this metal, as a preventive of tropical fever, is like that of the eruption of prickly heat (*Lichen tropicus*) on the skin, founded in error: the latter, I know from repeated experience, has no other basis than hasty popular opinion.

It would be easy to extend these remarks on fever to a greater length; but I have endeavoured to confine myself to leading points, and to those opinions of late authors which seemed to admit farther elucidation. I am not altogether without hopes, that, notwithstanding the low standard of merit in which this communication must rank itself, perhaps I have furnished here and there a *raw material*, which may be *worked up* into something of utility; or a hint which, even without any such expectation on *my* part, may be converted by others to the improvement of our profession, for which, in my humble sphere, I trust I am not without zeal and devotedness. At all events, a delineation of the disease on a great scale, and a detail of practical facts, can never be wholly useless; and I can only say, that I have described such facts and occurrences accurately, as far as my means of information reached.

*Account of an Hydraulic Machine for raising Water, called the
"Water Ram."* By JOHN MILLINGTON, Esq.

[From the Journal of Science and the Arts, No. II, for 1816.]

AMONG the various necessities of life, nothing is more conducive to the health and comfort of mankind, than a plentiful and regular supply of water for domestic purposes; but this convenience is often withheld from those who live at a distance from towns, or the usual machinery for supplying water, notwithstanding they may possess it abundantly in their neighbouring springs or rivulets; which, from their low situations, preclude the possibility of using or obtaining it in any other way, than by actual transportation in carts or buckets. The expense of erecting horse pumps or steam-engines is too great to admit of their general use in individual establishments. With a view to obviate these difficulties, and add to the comfort of those who may be deprived of the luxury of water, I beg to send you an account of a very simple self-acting engine, which is but little known in this country, though it has been several times beneficially used in France; and from the simplicity and certainty of its action, I am sure it only requires to be known and adopted to be approved.

The *belier hydraulique*, or water ram, as this machine was called by Mongolfier, who first constructed it about 1797, is applicable to any situation in which there is a fall of a few feet of clear water, and drainage to get rid of the superfluous quantity: and as it is simple and cheap in its construction, and requires no attendance after it is once adjusted and set to work, it is particularly applicable to the supply of houses or gardens, and pleasure grounds situated upon elevations.

The action of the water ram, as will be seen in the following description of it, is entirely dependent upon the momentum which water, in common with all other matter, acquires by moving; a circumstance which has often proved very detrimental and troublesome to plumbers and others, in fixing pipes connected with elevated cisterns.

It may have been observed by many, on turning a cock attached to a pipe so circumstanced, that the water flows with great violence; and upon shutting it off suddenly, a concussion is felt, the pipe is shaken, with a noise resembling the fall of a piece of metal within it, and the pipe is not unfrequently burst open near its end. This arises from the new energy which the water has acquired by being put in motion for a short time and then stopped, in consequence of which it makes a considerable mechanical effort against that end of the pipe which opposes its further progress.

This effect was experienced in a great degree at an hospital in Bristol, where a plumber was employed to fix a leaden pipe to convey water from the middle of the building to the kitchen below; and it was found, that nearly every time the cock was made use of, the pipe was burst at its lowest end; after making many attempts to remedy this evil, it was at last determined to solder a small pipe immediately behind the cock, which of course was carried to the same perpendicular height as the supplying cistern, to prevent the water running to waste, and now it was found that on shutting the cock the pipe did not burst as before, but a jet of considerable height was forced from the upper end of this new pipe. It therefore became necessary to increase the height of the pipe, to overcome, if possible, this jet, and it was carried to the top of the building, or twice the height of the supplying cistern; where, to the great surprise of those who constructed the work, the jet still made its appearance, though not in such considerable quantities; and a cistern was placed at the top of the house to receive this superfluous water, which was found very convenient, particularly as it was raised without trouble or exertion.

This is, I believe, the first water ram which ever had existence, the circumstance having taken place prior to Mongolfier's contrivance, though he is the first person who organised the machine and made it completely self-acting, without ever turning a cock. His construction is represented in the Plate, where A is a cistern (or part of a running brook which may be dammed up to make a head of water), and B C a quantity

of iron or wooden pipes extending from 18 to 30, or 40 feet in length, according to their diameter, to conduct the water away: these pipes are laid in a sloping direction, so as to reach the greatest depth *D* at which the water can run off, which may be from one to six, or eight feet below the head *A*. The water would naturally run to waste from the end *E* of these pipes; but that is closed by a blank or solid flaunch, and it is only permitted to escape through a round hole in the centre of the horizontal flaunch *F*, from whence it will run in an uninterrupted stream. This hole is, however, equipped with a valve within it, as at *f*, and this valve is so adjusted as to sink by its own weight in the water, while that water is motionless or moving slowly. Now if we suppose the pipe *B C D* to be supplied with water from *A*, that water will at first pass round the valve, and discharges itself at *F*; but as soon as it has acquired a small additional force by moving, it will be more than equivalent to the weight of the valve *f*, and will lift it, by which the passage of the water becomes instantly stopped, and an effort will be made to burst the pipe *D*; this is prevented by the second orifice over the letter *D*, communicating with the chamber *G* and air-vessel *H*, from whence there is an immediate communication by the pipe *I I I*, with the elevated situations to which the water is to be thrown. As the effect of the blow which the water makes is instantaneous, it becomes necessary to place a second valve *v* between the air vessel and the chamber *G*, but below the pipe *I I*, so that any water which is thrown into *H* by the effort may be confined there, and acted upon by the condensed air, instead of permitting it to return and equalize itself in the pipes *C*, *D*. The blow which the water makes is so sudden and violent, as to produce an expansion in the pipe *D*, which is as suddenly succeeded by a recontraction and trifling vacuum in *D*, by the tendency of the water to return up *C* when stopped; the effect of this is to bring down the valve *f*, by which a free passage is once more opened for the water, which again flows and shuts *f* as before, to produce another blow or pulsation, by which a second quantity of water is thrown up *I I*. Each repetition of this operation affords a fresh supply of water.

It will be evident that the valve *f*, as well as *v*, will require some adjustment as to weight. This is effected by making these valves of hollow brass balls, having a hole on one side, by which some shot or small pieces of metal can be introduced to adjust the weight. The hole is afterwards stopped by a screw which projects and forms a shank or tail to guide the valve. The screw over *v* is likewise to adjust the height to which that valve should rise, and to prevent its breaking away and getting into the air vessel, which it otherwise might do from the violence of the blow.

It has been found, that after using the water ram for a short time as it was formerly constructed, the air in *H* became absorbed and entirely disappeared, and by its ceasing to act as an air vessel, the water would not proceed to any great height up *II*. This is obviated in the present case by the chamber *G* placed between the air vessel and the pipe *D*. From the form of this chamber any air which enters it becomes confined in the recesses *K K*, and not only equalizes the action on the valve *v*, but makes the whole motion less instantaneous. *K K* becomes supplied with air in small machines by the falling of the valve *f*, which brings a small quantity of air down with it. In larger ones it will be necessary to apply a small shifting valve, or spring valve opening inwards to some part of the outside of *G*, when the air as it enters will rise to the top of *K K*, and as it accumulates will at length pass through *v* into *H* and keep it supplied with air. This latter contrivance I believe originated with Mr. Dobson, of Mortimer-street, Cavendish-square, who has paid considerable attention to the improvement of this engine, and proposes erecting them for the public.

In the rams which I have seen, the tubes *B*, *C*, *D*, have been from $1\frac{1}{2}$ inch to 4 inches diameter, and the ascending pipes *II*, one inch, or rather less. I have seen the valve *f* make from 50 to 70 pulsations in a minute, and I should think discharging near half a pint of water at each pulsation, at the height of 30 feet with a six feet head. I am, however, told, that a machine has been made which furnishes an hundred

hogsheads of water in 24 hours, to the height of 134 feet perpendicular, with a fall of four feet and an half.

I am not aware that the best proportion of parts has yet been ascertained, or the quantity of loss compared with the quantity delivered up I I, which must in a great measure depend upon the heights of the respective heads, and the size and length of B C compared with the perpendicular fall from A to D. I intend entering into an examination of these points, and if you should think the result of my enquiries worth inserting in a future number of your Journal, they shall be very much at your service.

I remain, dear sir,

Your's very truly,

JOHN MILLINGTON.

Upper Mall, Hammersmith,

10th June, 1816.



Some Remarks on the Arts of India, with miscellaneous Observations on various Subjects. By H. SCOTT, M. D.

[From the Journal of Science and the Arts, No. II, for 1816.]

DURING a long residence in India, I communicated to Sir Joseph Banks some observations that I had made on the arts of that country, and I intermixed occasionally some speculations of my own. He kindly sent replies to my letters, and took a very active part in endeavouring to promote several of their objects.

He lately told me that a part of my communications had not been without effect, while others had made no progress. Men slowly alter their habits, and receive, perhaps wisely, whatever is new with reluctance and distrust.

Among the new objects to which he referred as having done some good, he mentioned to me the Wootz, or Indian steel. This steel is now acknowledged to be of an excellent quality,

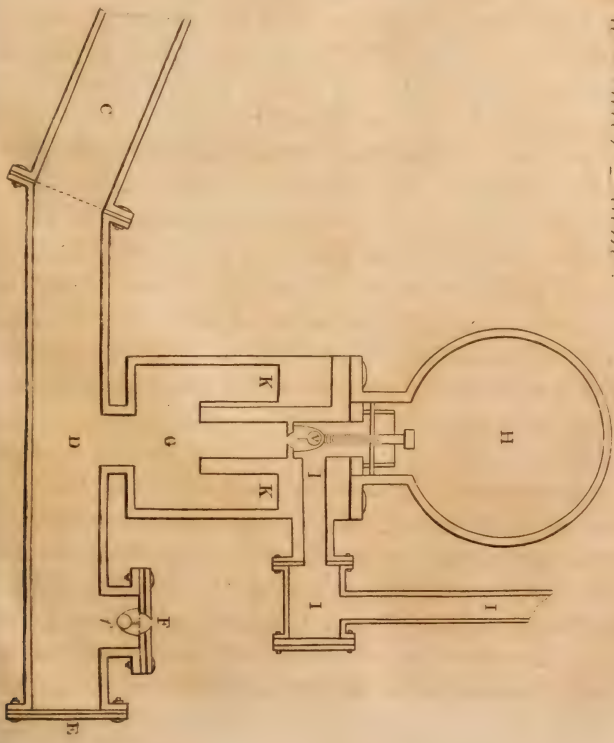
and better fitted for some purposes than any other yet known. After many ineffectual attempts to work it, it is now made into surgeon's instruments, razors, &c.

He next mentioned the operation for the restoration of the Nose, which has been performed in this country in consequence of a communication of mine to him. My letter was plundered of its contents, and before it reached him the publication of that part of it which regarded the nose was made in the *Gentleman's Magazine* for 1794. The account that I there gave of the operation was republished by M. Tennant, with some most extraordinary opinions of his own. I believe that Mr. Carpue will acknowledge, that without the assistance of my communication he never would have ventured on the bold operations which he so happily performed, acquainted as he might be with the method of the Italians and the ample volume of Taliacotius. In all this I claim little merit, farther than that of being the first person to give an intelligible account of an operation that cannot have been quite unheard of by my countrymen in India for many years past. On this occasion and many others I have thought (if we are to judge from experience), that it is as difficult to detect and to appreciate the practice of a simple art in India, as to discover a law of nature.

Among the things too that have made some progress in society, Sir Joseph mentioned the nitric acid; concluding the conversation with requesting me to publish an account of some of the facts that I had detailed to him on various subjects. With regard to arts so ancient as those of India, he thought that a knowledge of them would afford at least some gratification to rational curiosity. In compliance with this desire, I shall detail in as few words as I am able some parts of the correspondence to which I have alluded.

I mean in the present paper to confine myself chiefly to a detail of some of the effects that I have observed from diluted nitric acid taken internally, and used as a bath for a variety of diseases. The field is far too extensive to be well surveyed by me, or indeed by any one individual, and I must rest satisfied with a very general sketch. Though conscious of being quite

Mr. Wittington's account of a Water-Engine.



unequal to the task, I am carried on by the belief that no other person has yet had the same means of judging, and from the conviction that by the "*harmless remedies that I now recommend much good may be done in some diseases that are acknowledged to be beyond the ordinary means of relief.*"

It is well known that climate alters much the phenomena and the nature of the diseases to which the human body is liable. A great part of my life has been spent between the tropics, where the temperature is generally high, where the vegetable world in its genera and species puts on appearances that are quite new to the inhabitant of Europe, where the animals are generally very different, and where the diseases by which they are afflicted arise from other causes and with different symptoms. I have often thought that it would be curious and useful to mark, from sufficient experience, the peculiar maladies to which we are subject in a hot climate, as well as those from which we are exempt. If this were done with skill, it might give rise to a number of important conclusions both for avoiding and curing diseases.

Cancer is nearly unknown within the tropics. During twenty-five years I saw one case of cancer in a person who had brought the rudiments of the disease from Europe. From that case I learned the afflicting truth, that although a hot climate does generally prevent the formation of cancer, yet, when once it is formed, it does not cure it. I saw, in another instance, a cancer arise in India with an European gentleman, from often pulling the hairs from a wart on the skin of the cheek, and which produced at last the most deplorable effects. If such a complaint had appeared in any natives of the country, whatever might have been their cast or condition, I should probably have seen or heard of it.

Phthisis pulmonalis is not common in that climate, although it does occasionally appear. The true Phthisis is certainly a rarer disease there than many European practitioners suppose, for the lungs very often suffer from abscess and affections of the liver; and it is no easy matter to distinguish such complaints from the true phthisis pulmonalis.

Scrofula is rare, though particular causes do sometimes

produce it. Cold and moisture seem to be the great sources of the scrofulous diathesis, for the children of Indians, and even the ape kind, although free from the disease in their native climate, are very liable to scrofulous affections on being brought to Europe. Would it not appear then, that similar causes have a tendency to produce phthisis pulmonalis, scrofula, scirrhus, and cancer, and that there is some connection in their origin, and perhaps in their nature?

I never knew an instance of a biliary stone being found in the gall bladder or the biliary ducts, in India.

The formation of stone in the urinary bladder is nearly unknown between the tropics. I have indeed not met with a single instance of it, although I have known some cases where such a disease was imported and not removed, by climate. This exemption, however, from those dreadful diseases does not extend through a great extent of latitude; and it should also be remembered that altitude above the sea has similar effects to a more northern latitude. I speak of my experience in a country on a level nearly with the ocean, and having a barrier of ghauts or mountains towards the east. In the northern parts of India the maladies of Europe begin to show themselves. I knew a boy who got a stone in the bladder in Guzurat, for which he had been cut by a native surgeon. The perforation was made in nearly the same place that it is in Europe, and the operation was what is called, I think, by the *Gripe*.

I may take notice here of a case of stone in the bladder (it cannot be too often mentioned) which was remarkable for the singular mode of cure adopted by Colonel Martine, himself the sufferer. He then resided at Lucknow, but I believe the Colonel had lived in many of the northern parts of Hindostan. I knew well a surgeon* of the Company's service, who was intimate with the Colonel, and visited him at all hours, and often saw him carrying on his process for cure. It consisted in reducing the stone to powder, by a fine saw introduced through the urethra by means of a canula, and he

* Mr. Bright.

perfectly succeeded in removing the whole of it. The Colonel was an ingenious mechanic. His saw was made of the steel spring of a watch. He introduced the canula till it touched the stone; and then, by changing the position of his body, he pushed on the saw till it was, for a little way, in contact with the stone, and then moving it backwards and forwards, he reduced it to powder. My friend often saw him at this work, and occasionally more than once on the same day. The operation gave him no pain whatever; for soft parts plentifully covered with mucus, are under very different circumstances from hard and resisting bodies, and completely elude the teeth of so fine a saw. Soon after every sawing, he passed with his urine a quantity of the stone in the form of a powder. Although a parallel case will not often occur, where the patient is so intelligent and ingenious, and the final success so decisive, yet by long habit and guided by feelings known only to the individual, I should hope that a similar mode might *sometimes* be applied with advantage. No surgeon can effect this for another person. To place the stone and the saw in the proper positions, and to carry on the operation with success and without pain or injury, can only be done by the patient himself. The hopes of relief, the attentions and observations necessary to attain it, the repeated trials, with all the sources of employment and of comfort to a miserable man, may well reward him, even if the perfect success of Colonel Martine should be unattainable.*

Although a tropical climate does not at all times prevent the attacks of gout, yet they certainly are less common and severe than in cold countries.

* Since writing the above I have conversed with a very intelligent officer of high rank, who knew the Colonel intimately. He tells me that the instrument for reducing the stone to powder was rather a file than a saw, and that it was fixed to the end of a piece of whale bone. It was passed into the bladder through a canula. So accurately from habit could the Colonel judge of every circumstance, that he could tell when any part of the surface of the stone became more elevated than the rest, and could remove that part with the greatest nicety. On speaking to a friend now in town, who also was intimate with the Colonel, he was told, that the filing part of the instrument was made of a knitting needle, properly tempered for the purpose.

Acute rheumatism is rare between the tropics, but cases of it do occasionally occur. In like manner, the chronic kind is sometimes met with in India, and is more easily cured than in Europe.

While the glands, that are the common seat of scrofula, are less generally diseased between the tropics than here, other glands suffer there more frequently than in Europe, and in particular the liver and spleen. I have fancied at times that I could see mechanical causes for some of the derangements of the liver in a hot climate. The resinous matter of the bile seems to be there more abundant. It appears occasionally to separate, from its union with soda, when it stagnates in the liver and enlarges it, giving rise to all the phenomena of chronic hepatitis. By some means the calces of mercury stimulate that organ, or they give solubility to this resinous matter, which then passes through the ducts to the intestines. Such a bilious discharge, from the use of mercury, is the true signal of relief. When from long illness or other means weakness is produced, with a languid circulation, chronic hepatitis is almost a certain consequence. The *vis a tergo* in the liver is diminished, depositions take place, and I have seen after death resinous and spermaceti-like matter choaking and obstructing the ordinary course of the circulation, and greatly enlarging the whole mass. It is said, that in some parts of Germany the overgrown livers of geese and ducks are esteemed a great delicacy for the table. In order to produce them, they fix the animal by the feet to a board; they keep it motionless in a high temperature, and force it to swallow a great deal of nourishment. This is the case occasionally with our countrymen in India; a high temperature, little motion, with a plentiful diet; and the very same consequences make their appearance. While a very languid circulation of the blood gives birth with certainty to chronic obstructions of the liver, acute hepatitis, on the contrary, is produced by all those causes which quicken the circulation beyond its proper rate. Such are violent exercise, fever, and hard drinking, and, I might add, steel, and tonics, and bark. From the peculiar structure of the liver, and the state of the circulation of its

blood, it cannot flow much more quickly than is natural with impunity. How often are boys seized with a pain in the region of the liver, after running with rapidity?

The calces of mercury do certainly give the utmost relief, both in acute and chronic hepatitis. While in the acute kind we employ between the tropics the antiphlogistic plan, blistering, blood letting, and especially purgatives, we ought not for a moment, if the disease is severe, to delay the use of the calces of mercury internally, with the ointment externally, as being of more consequence than all the other means in our power. No condition, to which human nature is exposed, is more deplorable than that where an abscess has taken place in the liver. I know of no sufficient security in that climate against such an evil but mercury. As soon as the mouth gets sufficiently affected, and the system is impregnated with it to a proper degree, the pain, the fever, and the distress abate, and the patient remains quite secure from the risk of abscess, provided we have not used the remedy too late, and when such a change has taken place as must necessarily end in abscess. While nobody is better acquainted with the inestimable benefits that arise from the due use of mercurials than myself, nobody can better know the ill consequences that follow them. In those predisposed to scrofula, they excite it; in those with a tendency to consumption, they accelerate it; and they have other bad consequences that I need not mention. When, however, we are threatened with the formation of matter in the liver, we must neglect all those considerations, and submit to smaller evils, in order to avoid one of the most melancholy kind.

When in India, I was most anxious to discover a substitute for the mercurial calces, less injurious and equally efficacious, and I have not been entirely without success. I knew that the nitric acid acts most readily on the resinous matter of the bile, and I was in hopes that I might communicate such an acidulous state to the living body as should produce the effects that I desired. That it may alter the nature of the urine has been proved by Mr. Brande, who has recommended the use of it in a particular kind of urinary calculus. If large secreting

glands are thus materially affected by merely drinking this acid, I cannot doubt but that by bathing the whole surface of the body below the head, in a very dilute nitric bath, much of it may be absorbed, and more material effects produced. I had found that through the medium of the stomach the effects of the acid, if given to the wished-for extent, might be injurious, and I had tried to little purpose to combine it with substances for which it has but a slight affinity, expecting by such combinations to diminish its action on the stomach without destroying its useful qualities. From its absorption by the skin, some effects have arisen that I think very important. We are destined to find our way by experience, and can never know to what an untried agent may lead us at last.

I gave, many years ago, a short account of my trials with the nitric acid in India. It was obtained there by means of alum from common crude Bengal saltpetre. In that country both alum and saltpetre are plentiful and cheap; but I could not obtain the sulphuric acid, unless from Europe, or by making it myself. In both cases it would have been expensive, from requiring either the payment of freight for a long voyage, or the expense of erecting a considerable apparatus. I was satisfied, therefore, with the acid procured, as I have said, from unrefined saltpetre and alum. I was aware that that acid was far from pure. I knew that it was mixed with a considerable proportion of muriatic acid, derived from the muriates which that saltpetre so plentifully contains. I had long given this acid internally, and I had found it harmless, and sometimes very useful. I was far from thinking at that time, nor did I suspect till long afterwards, that pure nitric acid is unequal to the production of all the benefits which I sometimes derived from my acid applied to the surface or to the stomach. A suspicion of this kind first arose from the circumstances that I must now explain, at the risk of being thought tedious. At that moment I lamented the impurity of my nitric acid, and I was sorry to use alum instead of sulphuric acid, although in the end both of those circumstances have been highly useful, by leading me to conclusions at which I never otherwise could have arrived.

At the Presidency of Bombay we have extensive works for gunpowder, from which the armies on that side of India, and occasionally the navy, are supplied with that material of war. The manufacture of this article had fallen into the hands of some Parsees, who, as in other cases, had some practical knowledge, but no kind of science, to direct them. Complaints of the gunpowder had become very general. It grew moist in the magazines, and did not, after keeping, answer to the common modes of proof. So very ignorant were those men, that they perpetually returned all the liquor remaining after the crystallizations of their saltpetre on the next quantity to be crystallized. They judged their saltpetre to be sufficiently pure and fit for gunpowder when they saw the crystals clear and transparent, and free from charcoal or mud. After a committee of intelligent officers had reported on this state of things, I was desired to take charge of those works, which I continued to hold till my departure from India. By adopting the necessary measures, our gunpowder soon became as good as any in the world. One of those changes (and it is what leads me to the present digression) was the purification of the saltpetre. I had read in the "*Annales de Chimie*" a proposal of M. Lavoisier to purify that article for gunpowder, by reducing it to powder and then washing it with two portions of water. These two washings were sufficient to dissolve nearly the whole of the deliquescent salts, with a certain portion of the nitre. This to us was not only a very effectual operation, but it was one profitable to the public, for by evaporating the liquor of the two washings we recovered a quantity of saltpetre, impure indeed, but when mixed with charcoal, &c. still fit for making fireworks for the celebration of the weddings of the natives. As during the state of warfare which prevailed at that time, it was judged proper to prohibit the importation of saltpetre for sale, the product of our washings was gladly purchased. After saltpetre has thus been carefully washed, it is perhaps free enough from saline impurities to be fit for gunpowder; but I have always given it one subsequent crystallization, fearing it might contain a little sand or other matter, by which a spark and an explosion might be produced.

Being at that time impressed with a belief that the effects of my acid on the human body arose entirely from the *nitric acid*, I thought it would be a great improvement if I distilled it, not, as usual, from the crude saltpetre, but from such as had been washed in the way I have mentioned. This practice I continued for a long time, and indeed until I left India. Since using this purer saltpetre, I have often imagined that some of its beneficial effects were no longer produced, or were less remarkable. But my means of observation were cut short, first by very bad health, and then by being obliged to leave India for this country. Until lately I had no opportunity of seeing the sick here, or of recommending remedies for them; but still the *suspicion* of my having diminished the power of the acid, by purifying the nitre, hung on my mind, and I resolved to put it to the test of experience, as soon as I might have it in my power. About seven months ago I came to London, and by the aid of some intelligent friends I have been able to ascertain facts that I think interesting. I have found that the acid produces many effects in this climate as readily as it did in India. For the reasons just stated, I have used in all my late trials, not the nitric acid, but an acid composed of three parts of nitric and one of muriatic acid. With the result of these trials I have been sufficiently satisfied; nor have I had reason to think, that a constitution broken down by disease, by the use of powerful remedies, such as mercury, or by the long continued action of the poison of syphilis, receives less benefit in this climate from the acid treatment than I have derived from it in India.

I long ago said that I had removed syphilitic affections by the nitric acid (it was rather the nitro-muriatic), which resisted mercury long and judiciously applied. I had combined the external with the internal use of the acid, and I succeeded, in some of those cases at least, which have been called pseudosyphilitic. This state of syphilis is thought by some able and eminent men to be a new disease, and arising rather from the consequences of the remedy than from the poison of syphilis still existing in the constitution. I know well that an indiscreet, or even a large use of mercury, may give rise to

much evil; but I may be permitted to say, that no skill nor prudence in the application of that remedy will at all times prevent the occurrence of pseudosyphilis. In it I believe that the poison of syphilis still exists, remaining occasionally dormant, and becoming, from unknown causes, active and injurious, and exerting again all its specific effects. I think, however, that the cause of pseudosyphilis is a scrofulous habit, acted upon at once by the poison of mercury and the poison of syphilis, for to such a habit of body they are both poisons. We cannot destroy the syphilitic virus without calling into action the scrofula, to which there is a predisposition, so that on the patient is entailed a new disease not less afflictive than either of those from which it arises. It may perhaps be thought some confirmation of this opinion, that during the whole of my residence in India, where mercury is so commonly, so largely, and sometimes so injudiciously given for affections of the liver, I never knew a single instance of this *new disease* having arisen where syphilis was *certainly* out of the question. That this sort of syphilis is very common in this country, is evident from the inspection of many of our public hospitals, where patients are often seen, who for years together have been subjected to many courses of mercury, and a variety of useless or hurtful remedies. Even in our streets many sufferers in this way must attract the notice of every medical man. It is not enough to say, that the nostrums of quacks, and the treatment of empyrics, have produced such evils. I have observed, that cases do occasionally occur where the utmost skill of the present times is found to be quite ineffectual. I now earnestly recommend the nitro-muriatic acid bath for this disease, a means yet untried in this country. I see that the nitric acid is given internally by many practitioners in Great Britain, and occasionally, I am assured, with advantage. The knowledge of this would sufficiently reward me for all the trouble I have bestowed on the subject, and here I might rest satisfied; but I wish still further to advance the use and the utility of the remedy. Like the calces of mercury this bath affects the gums and the salivary glands, giving rise occasionally to a plentiful ptyalism. Though it reddens the

gums, swells them, and renders them somewhat tender, it never produces that nauseous smell nor those fœtid ulcerations which arise from mercury; nor from the bath did I ever know the least injury arise to the teeth. If the gums are much affected from the bath, it is generally prudent to stop its use or to diminish the absorption, by exposing a smaller surface to it. If we go on with it too long, some inconvenience is experienced: a degree of restlessness takes place, and the patient says, that he does not feel himself so well as he ought to do. Beyond this point I have seen no degree of harm from this general and powerful agent, and even this disappears on discontinuing it for a short time. I know no other means that are capable of producing effects at once so salutary and so considerable, so free from injury, with so little inconvenience or disturbance.*

If the acid be employed for syphilis or pseudosyphilis, either by the stomach or the skin, I should consider every trial as quite inconclusive where a ptyalism, some affection of the gums, or some very evident constitutional effect had not arisen from it. As with mercury, the system should be kept charged with it for a longer or a shorter time, according to circumstances. Mercury never could have obtained the character of a specific for syphilis if it had been managed as the nitric acid has been, if it had been generally given in quantities so small by the mouth as even to leave it in doubt whether it is capable of affecting the gums and stimulating the salivary glands. Why should not the nitric acid receive the same privilege and indulgence that is conceded to mercury? It is still a stranger in this climate, and on that account requires the more care and attention. There is nothing absurd in supposing that nature may have many substances in store capable of destroying or removing the syphilitic poison from the con-

* In this climate it will be found convenient to bathe only the feet and the legs daily, or twice a day. For this purpose a wooden tub may be used. The water when acidulated with nitromuriatic acid should taste about as sour as vinegar, or it should be of such a strength as to prick the skin a little after being exposed to it for twenty minutes or half an hour.

stitution: I say, then, in the spirit of the illustrious Bacon, “*fiat experimentum.*”

When I have removed a disease by the acid treatment that was regarded as undoubtedly syphilitic, I have been commonly told at last that we must have been mistaken, for that *nothing but mercury can cure syphilis*. I wish we had some chemical test for the existence of this poison in the body, that we might have more of the evidence of our senses and less of the wanderings of opinion. One of the states of syphilis, the least doubtful, is that of recent chancre, and this, though of a bad kind, I have seen in about a week completely removed by the bath.

There are no researches so difficult as those which regard the human body and the changes connected with life. The capacity of few men seems to me to be well adapted for them. The chemist may repeat his experiments as often as he pleases, he may vary them till he obtain results on which he can rely. It is very different indeed with the physician. The doubts and the darkness that surround him are in comparison tenfold. After all, it may be with myself that the whole of the errors lie: for who can judge of himself? I can believe that a man who is not of my opinion may be equally sincere with me. But the same appearances convey to each of us impressions of a very different kind. With such a person then I need not reason, and I will not dispute. I must ask him, as Rousseau did his antagonist, “What is there, sir, in common to you and to me by which we may be enabled to understand each other?”

I employed while in India the nitric acid by the mouth or as a bath for various complaints, as I never wished to confine it specifically to any one. I was anxious to get from experience a general rule for its application, and it was certainly not without some success that I used it for several diseased conditions of the body. I shall slightly mention a few of those complaints in which I have found it of advantage. For some affections of the skin I have derived benefit from the bath; it rapidly and effectually removes every sort of sores. This bath has the advantage of keeping perfectly unaltered for any length of time,

not suffering decomposition like water, and never emitting any kind of unwholesome effluvia. It is an agent that we employ with almost any degree of power. In those very weak and delicate I have plunged one arm into it only, or I have washed a portion of the skin with it. I have very often exposed the legs up to the knees in the bath, and by their means alone have been able to keep the mouth affected for a long time. When a greater power was required I have exposed the whole surface below the head to it. To all this may be added its internal use, if necessary.

Where the constitution has been weakened by fever or long continued disease, I have found in the nitric acid bath a tendency to renovate. It remarkably improves the complexion. In chronic hepatitis and a bilious disposition I have used it with much advantage. I have seen the happiest effects from it in aphthæ of the mouth and intestinal canal, where every other remedy had failed. This is sometimes a dreadful disease in India; is it the "cachexia aphthosa" of Dr. Latham? In many disorders of females, and in men worn out with obstinate intermittents, I have found it very useful. In short (and as a general rule), I have found the acid bath advantageous and salutary in all cases where mercury is useful, and with the additional advantage, that the acid treatment is attended by neither injury nor inconvenience.

As I had seen the good effects of nitric acid in pseudosyphilis, or that kind of syphilis that cannot be cured by mercury; and as I had long thought that pseudosyphilis arose from syphilis in some way combined with scrofula, I became anxious to know the effect of the acid treatment in pure scrofula. Since I came to London I have seen a number of trials made by different medical practitioners with the nitro-muriatic acid. Some of these cases were of long standing, and of the worst kind. The result on the whole has been very favourable, though none of the patients have yet used it for three months. In almost all the health has improved, and some of the sores have healed, or show a tendency to heal. I have not seen a cure effected in a single instance; but this could hardly have been expected; for where the disease is of long standing,

as with these patients, and where many glands are inflamed and enlarged, it is evident that a long time will be required to reduce them to the healthy state. I have seen remarkable relief in several people where the neck was much affected, much swollen, with many glands in a state of suppuration, so as to make the least motion painful and nearly impossible. In some of these the pain and swelling has much diminished, and a considerable degree of motion of the head is attainable without pain. In one girl in particular, who was reduced to a dying state, by merely drinking the acid, her health and strength have greatly improved, and the sores have healed or shown a tendency to heal. With experience so short and imperfect, I cannot venture to say more, than that it holds out a hope of relief for some states of that cruel disease.

I have just seen Mr. Carmichael's book on Scrofula, which contains some just observations; and he seems to prove, that a disorder of the digestive organs is often connected with it. The utility of the practice that I have mentioned is very consistent with his idea of an acidity prevalent in the *primæ viæ*, for the mineral acids are known powerfully to counteract such a tendency, by giving tone to the organs of digestion. This disease has been the source of gross empiricism; for at different times almost every product of nature or of art has been extolled for the cure of it. The boasted baths of the Greeks and Romans could produce little farther effect than what arises from hot or cold water, and are often nothing more than the mere semblance of doing something.

Of all the remedies for scrofula, those substances that contain chlorine *seem* to have been the most successful. Such are sea-water, sea-air, the muriates of lime, &c. &c. Sir Humphrey Davy has shewn in a very late paper, that the nitro-muriatic acid (the aqua regia of the old chemists) is not a mere mixture of nitric and muriatic acids. On the contrary, from their union a quantity of pure chlorine is evolved, and water and nitrous acid gas (the results of the new affinities) are produced. Is chlorine a material agent in my bath? If I were sure of this I might mix the acids, so as to produce it still more abundantly. It has always been observed that calomel and cor-

rosive sublimate are the most active preparations of mercury, perhaps from the chlorine held in the compound. Chlorine is now known to be an elementary body of the greatest activity, of the powers of which over diseases we are nearly in total ignorance.

I have for many years past given euchlorine for several diseases, combined in its nascent state with soda. It contains oxygen very abundantly, and in a loose state of chemical combination. I meant it as a substitute for the nitric acid, and it is a very good one. Although Sir Humphrey Davy had not at that time shown us the composition of euchlorine, I saw that I was in possession of a valuable substance, which I have never since ceased to use. Mr. Brande has had the kindness to prepare for me portions of this compound, and he has shown me an easier and a cheaper method of making it for common use, than the one which I was in the habit of employing. But I must defer what I have to say of this substitute for the nitric acid to another time.

I have thus concluded what I intended to communicate on a subject of great importance. I have recommended from experience the practice of charging the body with some of the mineral acids or their elements for various states of disease, by the stomach, and especially by the skin. I may be weak, or I may be wrong, but I have acted from conviction; and I cannot but hope that an abler mind and a happier day will yet confirm and extend the truths that I have but slightly touched upon.

“Alter erit tum Tiphys!”

H. SCOTT.

38, *Russel-square*, May 8, 1816.

Account of a Soda Lake in South America. By M. PALACIO FAXAR. Transmitted to the Editor by Charles König, Esq. of the British Museum.

[From the Journal of Science and the Arts, No. II, for 1816.]

IN Maracaybo, one of the provinces of Venezuela (48 miles east of Merida, about 8 degrees of N. L. and 70 degrees some minutes of W. Lon.), is a valley, called by the natives *Lalagunilla*, the small lake. On the south of this valley, which contains an extent of country seven miles in length and five in breadth, runs that branch of the Andes which extends along the coast of Venezuela, and rising in this spot to the line of perpetual snow, forms La Sierra Nevada of Merida.

The waters that descend northwards from La Sierra unite to form the river Chama, which traverses the neighbouring countries, Mucuchies, Merida, Exido, Lalagunilla, and Estanques, and loses itself in the woods which surround the lake of Maracaybo. Those, on the contrary, which descend southwards from the Cordillera are received by several rivers communicating with the Apure, which falls into the Orinoco. At a considerable height northwards, on La Sierra, is found the species of Cinchona, known in commerce by the appellation of Cinchona of Carthagena.

The north side of Lalagunilla is bounded by a limestone hill. The land rises imperceptibly towards the east and descends gradually several fathoms towards the west, until it reaches that tract of country which produces the Cacao (cocos butiracea.) The bed of the valley is formed of chalk; it is situated about 250 fathoms above the level of the sea.

The village of Lalagunilla is situate in the south of the valley; its inhabitants, a strong laborious people, are Indians, whose only occupation is agriculture and the extraction of the *Urao*.

Nearly in the centre of the valley is the lake which receives the rain water that descends from the neighbouring moun-

tains; but as even during the greatest drought the lake never becomes dry, it is supposed that it has some springs which supply it with water, independent of the rains. Its dimensions in the rainy season, in the widest part, are two hundred and ten fathoms by one hundred and six. On the eastern side, where the waters are deepest, its depth never exceeds three fathoms. To prevent inundations to the neighbouring cottages, a drain is cut on the south-east side, which carries the waters into the Chama. On the eastern side the waters are very shallow, and being contracted in width, give to the lake a somewhat oval form. It is on this side that many aquatic plants are found. The air of the valley being very dry, the climate mild, the sky serene, the country in a high state of cultivation, and the view of La Sierra Nevada truly sublime, a residence here is delightful, and many families from Merida and the environs constantly pass some months of the year at Lalagunilla.

The waters of the lake are impregnated with carbonate of soda, which crystallizes in the dry season, and is in that state by the Indians called *Urao*. The extraction of this salt, which is employed at Venezuela to prepare the *Mò* or inspissated juice of tobacco, has been long known and practised at Lalagunilla. At the end of the last century, when the court of Madrid monopolized the cultivation of tobacco, the right of extracting the *Urao* fell likewise to the crown. On the east side of the lake a magazine was erected for receiving the *Urao*, and another building as a residence for the *Teniente visitador*, or captain of Gens d'armes, in whom was vested the government of the lake, with a view to prevent a species of smuggling which the Indians are much inclined to practise, by secretly withdrawing the *Urao*.

The water of the lake is of a yellowish green colour, of a saponaceous quality, alkaline taste, and peculiar smell. There is no appearance of fish of any kind in these waters; the only living creature I could observe was an insect on the borders of the lake, which appeared to me a species of spider.

These waters having a strengthening quality, convalescents resort thither in the morning to bathe, and derive great bene-

fit from them in some cutaneous diseases. In many disorders incident to horses they are likewise very efficacious.

When the period for the extraction of the Urao arrives, which is every two years, those Indians of Lalagunilla, who are devoted to this employment, and who are called Huragueros, are embodied at the residence of the Teniente visitador. The Indians employed at this work are easily distinguished, by their hair becoming red. Being embodied, they proceed, in presence of the Gens d'armes, to sound the lake with a long pole, at the end of which is fixed a bar of iron, which serves to break the mineral. Having by these means found the parts where the Urao is most copiously deposited, they divide themselves into different parties (quadrillas), for the sake of facilitating their labour. Each party, composed of eight, ten, or more Indians, fixes a pole in the centre of the district allotted to them. Supported by this pole, the Huragueros plunge into the lake, and beginning by separating a bed of earth which covers the mineral, they proceed to break the Urao. When they suppose that a considerable part of the Urao is separated from the mass, they dive for it, and then rising again above the water, place it in very small canoes (piraguitas), which float round the spot. As there are several Indians who explore the same mine, the work goes on without interruption, but the same Huraguero is not able to plunge many times successively. The work, which begins early, and always in presence of the Gens d'armes, who are stationed on the borders of the lake, ceases at six o'clock in the afternoon, when the produce of the day's labour is deposited in the royal magazine, and is afterwards exposed to the heat of the sun.

The extraction, which lasts nearly two months, produces from 1000 to 1600 hundred weight of Urao, which is the quantity consumed in two years at Venezuela; but if more were required the lake would probably furnish upwards of four times that quantity. The difficulty of extracting the Urao may easily be imagined, but what is much worse, considerable danger attends it. If the Indian diver happen to lose his hold of the pole, or if some other accident prevent his rising promptly

to the surface of the water, and indeed, the Indians of Lala-gunilla are in general but indifferent divers, he is in danger of swallowing more or less of the alkaline solution. If the quantity drank be inconsiderable the bad consequences may be trifling; but if he happen to drink largely, he cannot survive it many days. Oil has been had recourse to in vain. Acetic acid might, perhaps, in such cases be administered with better effect. Father Rendon proposed, in 1808, to the Captain-general of Caraccas, to effect the extraction of the Urao by sinking a caisson, which when properly secured should be opened at bottom to get at the soda. This project, which undoubtedly at low water might be realised at a small expense, was rejected as impracticable.

When the extraction of the Urao is completed the superintendent of the tobacco, who resides at Merida, repairs to Lala-gunilla, accompanied by the Teniente visitador and others. The salt is weighed and paid for in the proportion of about one real of plata (about seven-pence) the pound. It is then conveyed into the general storehouse for tobacco at Guanare, in the province of Caraccas, whence it is distributed to the lesser warehouses.

If a heap of tobacco leaves covered with the green leaves of other plants be exposed to the sun for a few days, the tobacco begins to ferment. If then put into a press a red liquor may be drawn from it, the exhalations of which are intoxicating, and its taste very pungent. This juice drawn from the tobacco is called Anvir, but when reduced to a syrup, by evaporation, it is termed Mò. If the Mò be mixed with the Urao when dried, roasted, and pulverised, it forms the Mò dulce, if the proportions be preserved of an ounce of Urao to a pound of Mò; or otherwise Chimò, if two or more ounces of Urao be mixed with a pound of Mò.

In the province of Venezuela, and especially in Barinas and part of Caraccas and Maracaybo, Mò is much used and likewise Chimò, which is kept in small horn boxes, and occasionally persons put a little into their mouths. The Mò, and especially the Chimò, produces a copious salivation, stimulating at the same time the nervous system, which in these

climes, where the senses are blunted by the excessive heat, is productive of a degree of pleasure.

It is likewise used in medicine for spasmodic complaints, which in these countries are both frequent and dangerous. It is said that a little Chimò held in the mouth protects swimmers from the electric power of the cramp fish (*Trembladores*.)

The sale of Tobacco, the Mò dulce, and Chimò, in the Captaincy-general of Venezuela, produced, in 1804, 700,000 piasters, after every expense attending it was paid.

I had the honour of transmitting last year to Baron Humboldt, in Paris, a specimen of the Urao, which Colonel Duran brought to Europe. It was analysed by M. Gay Lussac, who pronounced it to be natron, in no respect different from that found in the lakes of Egypt and Fezzan. The mass neither contains sulphuric nor boracic acid, but a little subcarbonate of ammonia. On comparing the Urao with common subcarbonate of soda, we find that it contains more carbonic acid and less water.

In the environs of Lalagunilla, as well as in the roads to Merida, and especially near the river Albarregas, there are some mountains which are very distinguishable among the others by their superior verdure, and by the abundance of some plants, principally the Rosa de Muerto; and precisely the same species of verdure and the same plants are found on the mountains where are the mines of rock salt at Zipaquira, and at Enemocon of Cundinamarca in New Granada. Finding these similarities, I may venture to form a conjecture that in the environs of Lalagunilla there must likewise exist muriate of soda; and this being ascertained it would perhaps contribute to explain the formation of natron at such a considerable height above the level of the sea, which is more than sixty leagues distant from Lalagunilla.

Proofs of the Bulam Fever attacking the Human Frame only once. By W. Pym, M. D. Inspector of Hospitals.

[From the Edinburgh Medical and Surgical Journal, for April, 1816.]

IN my observations upon Bulam Fever, page 122, I have mentioned that all the officers and men quartered in Gibraltar during the prevalence of the fever in 1809, who had had it at a former period in the West Indies, escaped it.

And, at page 27, that, out of the whole civil population of the garrison (amounting to nearly 14,000), only 28 persons escaped an attack of it; and of this small number 12 had had it at a former period, either in America, in Spain, or in the West Indies.

At Gibraltar, during the prevalence of the disease, in the years 1810, 1813, and 1814, there was no well-authenticated instance of a second attack; every person escaped it who had had it at any former period. And this fact is now so well established there, that, among the quarantine regulations against the introduction of the disease this year (1815), all the troops who have not passed the disease are encamped, while those who have passed it are doing the duty of the town.

At Cadiz, Carthage, and Malaga, the fact of persons not being liable to a second attack of this disease is considered to be as firmly established as it is in small-pox.

The following circumstantial evidence respecting the malady at Gibraltar in 1804, establishes the fact beyond a doubt. In the corps of Royal Artillery, there were only two officers who escaped an attack of it, viz. General Smith and Captain Campbell, both of whom had had it some time before in the West Indies.

In the corps of Royal Engineers, there was only one officer, viz. Captain Thackeray, who had had it in the West Indies; and he was the only one who escaped it, excepting Colonel Fyers, who kept himself and family in quarantine.

In the 2d, or Queen's Regiment, there were five officers,

viz. Colonel Jones, Major Kingsbury, Captain Walsh, Paymaster Wainwright, and Assistant-Surgeon Borlase, who had had it in the West Indies, and all escaped it, when every other officer in the regiment was attacked by it.

In the 10th Regiment, every officer was attacked by it, excepting Captain Carpenter, who had had it in the West Indies.

In the 13th Regiment, there were seven officers, viz. Lieutenant-Colonels the Honourable C. Colville, Dance, Scott, Major Belford, Captain Wilkinson, Quarter-Master Murray, and the Adjutant, who had had it in the West Indies, and all escaped it at Gibraltar, when every other officer in the regiment was attacked by it.

This same regiment, with five of the above named West India officers, and ten who had had it at Gibraltar, embarked for the West Indies in 1808, where they all escaped the disease, although eight of the newly appointed officers fell victims to it.

In the 54th Regiment, all the officers were attacked by it, excepting Colonel Derby, Captain Lowis, and Surgeon V. Dwyre, who had had it in the West Indies.

This regiment, in 1808, returned to the West Indies from Europe, filled up with new officers and men; and, after being 18 months in Jamaica, was attacked by and suffered severely from this disease, when all those who had had it at Gibraltar escaped it.—*Vide my Observations upon Bulam Fever, Mr. Redmond's letter, page 73.*

In the corps of Royal Barrack Artificers, every officer and man was attacked by the disease, excepting Sergeant Jones, who had had it in the West Indies.

In the regiment of Rolle, there was only one officer, viz. Lieutenant Muller, who had had it in the West Indies, and he was the only officer in the corps who escaped it.

The medical men at Gibraltar, during the first ten weeks of the disease, were 24 in number. Six of them had had it in the West Indies, and all escaped; the remaining 18 were attacked by it, of which number seven fell victims to it.

One more proof of the Bulam fever not attacking a second

time, was in the 70th Regiment, which suffered severely from the disease in the West Indies, in the year 1794. This regiment returned to that climate from Europe in the year 1800, filled up with new officers, with the exception of six, viz. Colonel Dunbar, Major Elliott, Captains Johnstone, Lawrence, Hutchinson, and Boat, who had had the fever at a former period, and who now escaped it, although the corps buried ten of the newly appointed officers in a very short time.

The 55th Regiment, quartered at St. Lucia, in the year 1796, was nearly annihilated by yellow-fever, when the skeleton of the regiment returned to England. There it was filled up with new officers and men; and, after being six years in Europe, arrived in Jamaica in the year 1802, where it again suffered severely from the same disease, having buried 21 officers. The surgeon of the regiment, Mr. Macmillan (now surgeon to the forces), says, it is worthy of remark, that every individual in the corps was attacked by this fever, excepting himself and ten of the officers, who had had it in the year 1796.

Upon a moderate computation, there were 150 officers at Gibraltar who had not had the disease before, and 25 who had passed it in the West Indies; and, making allowance for one or two doubtful cases, where the disease was so mild as not to confine the patient to bed, 145 at least out of the 150 were attacked by it, while every individual of the 25 who had had it before, escaped it;—proof positive that the Gibraltar, West India, or Bulam fever, are the same disease, and that the human frame is not liable to be attacked by it a second time, even after a lapse of ten years.

The 13th and 54th Regiments are proofs that persons who had it in Gibraltar are not liable to it in the West Indies. I have given numerous proofs that persons who had it in the West Indies were not liable to it at Gibraltar. And the 13th, 55th, and 70th Regiments, prove that persons who had it in the West Indies are not liable to a second attack upon their return to that country, after having been several years in Europe.

I am truly surprised that its peculiarity of attacking the human frame but once, has not been sooner known; and now, that it is mentioned, that it has not excited greater attention. Lining mentions it particularly, in the Edinburgh Medical Essays, 50 years ago. In Sauvages' last editions, about 1768, it is positively mentioned. The English have long known the fact under the name of *seasoning*, and the French of *tribut, climaté, or une idiosyncrasie réfractaire à la contagion*. Monsieur Berthe, in mentioning the disease at Cadiz, says, "Le petit nombre de ces individus ainsi privilégiés a été observé parmi ceux qui avaient habité les Antilles." The emigrants from St. Domingo were proof against the contagion of Philadelphia in 1793—4. But vaccination was long known in Gloucestershire to the dairy-men before Dr. Jenner's discovery; and, with respect to my discovery in the yellow-fever, I cannot give it up to the Spanish practitioners. I made the discovery that the West Indians were proof against it on the 20th *October*, 1804, or rather the 19th, for that was the day that I requested Sir Thomas Trigge (governor) to order the men who had been in the West Indies to be paraded.

The first Spanish physician that mentioned it was Arejula, and he did not publish until 1806. Sir J. Fellowes gives the credit of it to the Spanish physicians generally. No individual one has claimed it. It certainly was not known among them in 1803; nor do I believe it was ascertained in 1804, until after the time that I discovered the non-liability of the West Indians, when I requested my friends in Gibraltar to write to Malaga and Cadiz, where inquiry was made, and the fact proved.

London, 6th January, 1816.

Case of Artificial Pupil. By Mr. MOORE, Surgeon, Belfast.

[From the Edinburgh Medical and Surgical Journal, for April, 1816.]

HUGH QUIN, a labouring man, aged about 48, applied to me in April last. When a boy, he lost the sight of the left eye by an accident. In September, 1814, he struck the sound eye against the end of a stick, and ruptured the sclerotic coat above the cornea, to the extent of half an inch, in nearly a semi-circular direction, with the concave part towards the cornea. A portion of the vitreous humour protruded, supported by its capsule and the flap made by the wound, and formed a tumour about half the size of a common bean. The eye was very much inflamed; there was a considerable discharge of matter like pus and mucus mixed; and severe pain in the temples and forehead, occasionally shooting to the vertex. The pupil was closed in consequence of the continued inflammation, which had now lasted eight months, and the iris had that rugose appearance we often see in closed pupil, and was drawn upwards by its attachment to the ciliary ligament, which ligament was drawn upwards by the protrusion of part of the vitreous humour. He could just discern light from darkness, at the clear light of a window or door.

On examining the eye, the following indications obviously presented themselves: 1st, To abate the inflammation in the eye, and relieve the pain in the forehead and temples. 2d, To remove or lessen the size of the tumour, as the friction of the upper eye-lid on it caused a considerable degree of irritation. 3d, To procure admission for light into the eye by an operation.

In order to fulfil the first, two grains of submuriæ hydrargyri were given at bed-time, and a drachm of pulv. jalap. comp. next morning. These were repeated twice a-week; and a solution of acetate of lead was very frequently applied to the eye by means of linen rags dipped in a large basinful of it. By continuing this plan a fortnight the inflammation was

nearly removed, and the pain in the head and temples quite gone.

Then, wishing to remove the tumour, I punctured it with the cataract-needle, and squeezed out the greater part of its contents, which were of the consistence of jelly, and appeared to be the vitreous humour thickened. In a few days a little inflammation, that had been excited by pressing it, abated.

I then proceeded to the operation, in presence of Surgeon Macdonnel of this town, and assisted by Staff-Surgeon Latham. Having fixed the eye with a speculum, I pierced the cornea with the extracting knife, half a line from the sclerotica on the outside, and a little above the transverse diameter of the cornea, and continued the incision to its lower part, keeping at the same distance from the sclerotica. I then introduced a very small hook, and fixed it in the centre of the iris, carefully avoiding the lens; the iris being gently raised, the point of a fine pair of scissors was introduced behind the hook, and the raised part snipped off and brought out. There was a slight effusion of blood from the iris, which rendered the eye turbid. The antiphlogistic plan was continued, as above mentioned, and in about a week the effusion was absorbed, and the eye became clear. We then found the pupil in its proper place, and fully the natural size; such as it usually is in a moderate light, and quite circular, except the part near the external angle, towards which it was lengthened a very little, and the margin of that part not so smooth or well defined as the other part of the circumference. He could now discern colours, point out the different objects in a room, and the panes of a window, or the colour of people's clothes at the opposite side of the street. In a few days he went home to the country with a very useful degree of vision. It is now five months since the operation, and I have lately heard from him. He is able to follow his business as usual, and the sight of the eye is as good as before the accident, except that the pupil has not the power of contracting, and it is necessary to wear a shade over it in a strong light.

As this affection of the eye has not been much attended to, it may not be irrelevant to give a slight sketch of the different

methods that have been practised for its relief, with a few remarks.

It appears that Cheselden was the first to perform the operation; and from his manner of doing it, he must only have considered that closure of the pupil which succeeds extraction or depression. He introduced a couching-needle, having a cutting edge only on one side, through the sclerotic, a line and a half from the cornea; and, pushing the needle through the iris near the external angle into the anterior chamber, and carrying it nearly as far as that side of the iris next the nose, he then turned the edge backwards, and withdrew it, so as to make a transverse section of the iris.

This operation has not succeeded in the hands of other surgeons; and it is evidently not adapted for a case of closed pupil where the lens is in its place, as it must be injured by introducing the needle into the posterior chamber. Besides, the incision of the iris is apt to unite again, and render the operation useless.

The method proposed by Janin, by making an incision the same as in extraction, and, with a fine pair of scissors, making a perpendicular division of that part of the iris next the nose, is better than Cheselden's, but I think is liable to two objections. The incision in the cornea is too large; one half the size or a little more is sufficient; and by carrying the incision farther than the lower part of the cornea, the flap is apt to be elevated by the lower eyelid, and prevented from adhering, and part of the iris is apt to protrude. The other is, cutting the iris perpendicularly on the part next the nose. In this way it will admit a portion of light, but the sight would be more extensive and better if it were in the proper axis of vision.

Scarpa has recommended to separate the iris from the ciliary ligament, by introducing a needle through the sclerotic, two lines from the cornea, and tearing the iris from the ciliary ligament, at the part next the nose.

He has practised this method in a few instances successfully; but that eminent surgeon only takes into consideration the case of closed pupil after extraction, or depression, or where the lens has been absorbed by solution. He informs us,

that there is great pain attending it; and also that it was a month and sometimes more before the blood effused in the aqueous humour has been absorbed. He has a great objection to cut the cornea after extraction, or depression; thinking that it will excite great irritation. The pain and irritation, however, is much less in opening the cornea, and cutting the iris in its centre, than piercing the sclerotica and tearing the iris from the ciliary ligament. Besides, the pupil is not in its proper place, where we ought always to endeavour to make it; unless there is some particular objection, such as an opacity of the cornea; and in that case we are obliged to make it opposite to whatever part may be transparent.

The late Mr. Gibson of Manchester punctured the cornea, so that part of the iris might protrude, and with a fine pair of scissors snipped off the protruded part, so as to form a pupil. This is a safe method, and is adapted for those cases where there is but part of the cornea clear, and the natural pupil sound, but obscured by the opacity. In puncturing, or making an incision in the cornea, it requires one of a considerable size to permit the iris to protrude; and when the pupil is made in that manner, it is behind the scar (or very nearly so) left by the incision, which may cause some obscurity in the sight; and I think it probable, that the iris and cornea may adhere, as we sometimes see after extraction.

Sir William Adams practises a method different from either of the foregoing. He introduces a small knife with one cutting edge only, and makes a transverse incision in the centre of the iris of a proper size for a pupil, and at the same time cuts up the lens, (as it must be wounded in making the pupil) in order that it may be dissolved in the aqueous humour, and absorbed. The patient may obtain a tolerable degree of sight no doubt; but it must be still imperfect, owing to the loss of the lens; and it may be sometimes necessary to break down the lens repeatedly before the solution is completed. Where I have seen it performed, there was a considerable degree of inflammation, and the cure was very tedious. Probably we may not always be able to save the lens; but I am

induced to believe, that most surgeons would attempt it, and that there is a reasonable prospect of success.

In performing the operation as described in the case related above, the only risk is, that of injuring the lens with the hook, when raising the iris to snip it with the scissors; but in the hands of a surgeon of tolerable steadiness, and accustomed to operate on the eye, there is very little danger. The hook I used is every fine, the curved part not being more than two lines, or two and a half in extent, and sufficiently curved to keep its hold until the piece was cut out. Raising the iris is of the greatest service, as it enables us to cut out a piece nearly circular; which makes a good pupil, and prevents it from adhering again, which it generally does, if there is only an incision made in it. The scissors used are somewhat concave, such as are used in cutting a piece of skin from the external part of the eyelid, in cases of inversion; and, I think, they make the pupil more circular than straight ones would.

From the foregoing, it appears that we may divide the cases that require the operation for artificial pupil into three species.

1st, Where the pupil has closed in consequence of the removal of the lens by an operation.

2d, Where the pupil has closed in consequence of inflammation from an accident, or some other cause, and where the lens is in its natural place.

3d, Where there is an opacity of the cornea before the natural pupil, that prevents vision, and there is some other part of the cornea clear.

In the first, either the operation practised by Scarpa, or the one described in the preceding case, may be adopted at the option of the surgeon. I have stated some reasons above for preferring the latter.

In the second, the operation used by Sir William Adams, or the one described in the foregoing case, may be adopted. I have also stated some reasons in favour of the last.

In the third, it is obvious we must make the pupil opposite whatever part of the cornea may be clear.

SELECTED REVIEWS.



The History of the Small-Pox. By JAMES MOORE, Member of the Royal College of Surgeons in London, Surgeon of the Second Regiment of Life-Guards, and Director of the National Vaccine Establishment. 8vo. pp. 312. Longman and Co. London, 1815.

[From the Edinburgh Medical and Surgical Journal, for January, 1816.]

THIS is a curious and a very amusing volume;—a sort of commendation, by the way, which we have not often occasion to bestow upon the subjects of our critical examination in this Journal. Mirth and medicine, indeed, are not very necessarily combined; but the author would have degenerated, and been unworthy his name and parentage, if he had given us nothing, in such a history, but a sombre detail of pestilence and physic. His little work, (little in point of size, but not in point of labour,) bears internal evidence of extensive and varied research, in the minute details of medical biography, and the curious historical anecdotes, with which it abounds; and which are pointed by not a little shrewd criticism, medical, moral, and political, and by a considerable portion of satirical humour. The work is dedicated to Dr. Jenner, and is said to have been composed, together with a history of cow-pox, hereafter to appear, with the view of aiding that enlightened benefactor of mankind in the extermination of the variolous pestilence, by convincing the public of the baneful effects of the one and the benign influence of the other, by thus contrasting their portraits. The opposition which vaccination has experienced renders such aid, he avers, necessary; “for,” as he quaintly expresses it, “among the practitioners of the healing arts, Hygeia found enemies; and Disease and Death, friends.”

In the first chapter, he treats briefly of "various opinions on the origin of the small-pox," and settles very expeditiously the question of the existence of the disease in the time of the Greeks and Romans, which he determines in the negative; principally upon the score of the accuracy of those writers in describing diseases with which we are still familiar, and of the impossibility of supposing them capable of overlooking the striking characteristics of small-pox, which were so minutely described by far inferior writers, the Arabians. We shall not set up any formal defence of the opposite doctrine, in favour of which, however, we think there are many circumstances of considerable weight, and we should have been glad if the author had not presumed upon the refutation by other writers, but had attempted to satisfy us himself. With all due veneration for the ancients, at least of that small number who were original observers, we think those sweeping assertions of their unvarying accuracy in the diagnosis of diseases, which preclude all idea of their having seen a formidable disease, without distinguishing it from all similar maladies, are the effusions of pedantry, and not justified by actual observation, or by the history of medicine. Have not these writers generally classed all violent and fatal diseases under the term *pestilential*? Have they any where given any thing like such an account of the common plague, as an ordinary ship's-surgeon would now give us from the Mediterranean? It appears, indeed, that they were generally too much afraid of encountering pestilence, to be able to give us very accurate histories of the symptoms, and too often fled from the cities where it prevailed. They were also blinded long before the time of Galen, by their hypotheses of the humours, and were content to determine whether an ulceration or eruption was the discharge of a bilious or phlegmatic humour, without attending to the history of symptoms. We must acknowledge, that the chapter which Aëtius has preserved from the works of Herodotus, a Roman physician (which are unfortunately lost), appears to us a body of positive evidence, which strongly opposes all such negative evidence, as the mere silence of other writers from Galen to Actuarius. Mr. Moore notices this sin-

gular chapter very slightly, by naming it only in the margin: we think it merited more of his attention; and that it is impossible to settle the question without a thorough explanation of it. There is no where, perhaps, a more distinct statement of nettle-rash,—of the little herpetic eruption about the mouth and *alæ nasi* at the decline of slight fevers,—of the *petechiæ* in fevers of a more typhoid character, “*à pravis humoribus*,”—and of the ulceration and carbuncles of “*malignant and pestilential*” fevers, than in this chapter; and at the same time the symptoms of small-pox appear to be mentioned with no small accuracy, and many of the prognostics and diagnostics pointed out.* What other eruptions, “the most malignant when ulcerating the face, and when most numerous rather than when few, &c.” accompany pestilential fevers, save small-pox? But yet so much under the influence of prevailing hypotheses was this discriminating writer, that he considers all these eruptions only as “signs of an abundance of corrupt humour, corroding the body.” It is some impeachment of the accuracy of the other Greek writers at Rome, after Herodotus, that they have omitted to describe distinctly these eruptive fevers, with which he was obviously familiar. There is some reason for supposing that the great pestilence at Athens, the effects of which have been so well described by Thucydides, was small-pox. It was obviously not *the plague*; (for neither buboes nor carbuncles are mentioned;) but a disease in which the skin was extensively affected, being “red or livid, with an eruption of small pustules and ulcerations.”† It might, indeed, have been that epidemic, of which we happily know little in modern times, and which was the frequent result of famine, so admirably described by Lucretius under the appellation of “*Ignis sacer*.”‡ But the very obscurity of these accounts is a proof, that neither physicians nor philosophers were very accurate in their discrimination of the various species of pestilential fevers, all of which they deemed but mo-

* See Aëtius, Tetrab. II. Serm. I. Cap. 129.

† Φλυκταίναις μικραῖς καὶ ἄλκεσιν ἐξηνηκός. Thucyd. Lib. VI. § 49.

‡ Lib. VI.

difications of the same thing; and it renders every inference from their silence on any particular pestilence nugatory.

Having settled the dispute respecting the ancients, Mr. Moore refutes very satisfactorily the statement of Dr. Paulet respecting an epidemic in France in 580, of which Queen Anstrigild, wife of Guntram, king of Burgundy, and the two sons of Childeric and "the dreadful Fredegonde," died. This was called *variola*, and affords the first instance, he says, of the use of this word. But upon the authority of Gregory of Tours, and of the Herman chronicle, Mr. Moore shews that this epidemic was the common plague, conjoined with dysentery. The story of the princess Fredegonde has nothing to do with the author's history, but it is too good a story not to be told, as it would have produced from Shakspeare, "a drama, equal to that of Lady Macbeth;" and it occupies three or four pages in Latin and English, and affords scope for one or two satirical squibs. His next source of authority was that ponderous collection of lies and absurdity, the Lives of the Saints, compiled in about forty folio volumes, (which constitute but three-fourths of the intended work) by the Bollandists. As these lucubrations relate the proceedings of the early Christians, who were much concerned in attending the sick, it might be expected that they would afford some information respecting the prevalent diseases, at a period not much later than the era of Galen and his successors, or at least some centuries before that of the Arabians. We have heard, indeed, that the late Dr. Willan believed that he discovered in this work, some evidence of the existence of small-pox in the second and third centuries: but Mr. Moore does not appear to have found at least the word, *variola*, before the thirteenth century. He admits, however, that he did not labour much in the perusal of this ponderous work; and surely the non-occurrence of the term, by which this disease has been designated in modern times, is no proof whatever of the non-existence of the malady, which might have been described, among other severe maladies, before any specific name was assigned to it. But while he contends that there is no evidence of the prevalence of small-pox in Europe so early as the sixth century,

the author believes, that the opposite opinion, adopted by Meade, Dimsdale, and others, that it was not introduced till the return of the crusaders about the end of the eleventh or beginning of the twelfth century, is equally erroneous.

In Chapter II. he proceeds to trace the earliest accounts of the disease in Asia and Africa, whence it is commonly believed to have been imported to the western kingdoms; and begins with the records of China, one of the earliest inhabited countries in the world. For our knowledge of these, we are indebted to the Catholic missionaries, who, by their address and influence, gained access to these documents. Mr. Moore details some evidence from the works of the missionaries, extracted from authentic Chinese publications, from which it appears, that not only the small-pox, but even some modes of inoculation, were familiarly known at a very remote period, probably long before the commencement of the Christian era. At the end of the seventh century, it is mentioned familiarly as an epidemic, in the chronicles of Japan, among the ordinary incidents of the time. And in Hindostan, "according to the traditions of the Bramins, the small-pox is of immense antiquity. It has several names in the ancient Sanscrit language, and its very early existence in that country is proved by their sacred books, and by the mythology of Hindus." The author collects from M. Sonnerat the genealogy and attributes of the goddess who presided over the small-pox, and relates also another account of the same deity from Baldæus. The existence of this superstition, and of various idols, as well as the practice of inoculation among the Bramins from very ancient times, prove the antiquity of the disease in India: and from a collection of original Hindoo drawings, Mr. Moore has engraven a representation of a procession, exhibiting the actions and the attributes of this terrible goddess. These religious rites, Mr. Moore observes, are decisive proofs of the dread in which small-pox was held, when human power was deemed inadequate to resist the calamity; and travellers in later times have been struck with the dreadful alarm, which its occurrence excites in China, India, Tartary, &c. In the latter country and Thibet, it is deemed a plague, and the pa-

tients are not only left to chance, but shut up from all communication. These circumstances, and the want of free communication in those countries, are considered by Mr. Moore as affording an explanation of the non-extension of the disease to Persia and Greece, long before the time of Hippocrates; and he attempts to account for the non-importation of the infection by the armies of Darius and of Alexander, in their respective invasions of India, by the long time which elapsed in so distant a warfare, the numbers of men who perished, and the extent of the deserts which were recrossed, which would give time to purify the troops from infection. Something like the small-pox, indeed, seems to have occurred near the mouth of the Indus, before the embarkation of Nearchus, according to the account of Quintus Curtius; but it is probable, as the author suggests, that the sick would not survive the hardships which the army was obliged to endure. Mr. Moore then briefly traces the progress of ancient commerce with India, and shews that the length of the voyage, as well as of the overland journey, was too long to admit of a probable communication of small-pox, even after Hyppolus had shortened the course, by trusting to the western monsoon, and stretching across the Erythrean sea, without compass, from the mouth of the Arabian gulf to Musiris. Even this was a voyage of a year. But towards the close of the sixth century, the spirit of commerce spread among the Persians, who brought from India the commodities which were wanted in the west; for their vicinity to India gave them great advantages over the Egyptian merchants:

“But,” the author adds, “it also augmented the danger of transporting the variolous contagion. Indeed, whatever attention might have been paid by the commanders of these merchant-vessels, it was impossible that this calamity should have been avoided much longer; and, as ships coming from India, both in their passage to the Persian gulf, and to the Red Sea, frequently touched at the Arabian ports, that country was peculiarly exposed, and there accordingly it was first observed.” p. 45.

In Chapter III. then, we are informed how “the small-pox

appears in Arabia, and follows the track of the Saracens." In the year 569, the celebrated religious war, called the war of the Elephant, occurred; in which Mecca is related to have been preserved by a miraculous destruction of the invading army, by a flight of supernatural birds, which killed the Abyssinians by dropping small stones like peas upon their heads. Mr. Moore has adduced some documents, which tend to prove that the small-pox and measles first appeared in Arabia in that year, at the siege of Mecca, and that the two species of supernatural birds were but fabulous representations of these two diseases; a suggestion which was made by Mr. Bruce, after examining some Abyssinian records. The place and period of the origin of these diseases, was but too favourable to their dissemination. They were accordingly soon known at Alexandria, where the first treatise on the small-pox was written by Ahron, (according to the testimony of Rhases,) who lived there during the life of Mahomet. This enthusiast, it is well known, was born in the same year in which Mecca was besieged; and he and his successors contributed most fatally to the extension of pestilence, even to the shores of the Atlantic. This account accords with the researches of Dr. Woodville on the same subject. The latter considered the disease, indeed, to have been carried to Alexandria in 638 by the Arabians, and to have been altogether unknown there before the siege of that city. This he infers from the silence of Paul of Ægina, (who was a contemporary of Ahron at Alexandria,) respecting the small-pox, although this writer affirms that he had omitted no disease then known. Mr. Moore attempts to explain this, by supposing that the work of Paul had been written before his settlement at Alexandria; which he thinks is probable, from its being little more than a compendium of Galen and Oribasius, and from this author being placed by Hali Abbas as the last of the ancients, while Ahron is called the first of the moderns; the epoch of the Hegyra, A. D. 622, being assumed by Hali as the boundary. May not his Greek education have somewhat warped his observation, and induced him to confound the disease with other pestilential maladies? It would seem, as Dr. Woodville

remarks, that Ahron did not describe the small-pox as a *new* disease, since Rhases strenuously contends that the disease was known to Galen, and he was perfectly familiar with Ahron's works.

At all events the small-pox, which was first distinctly described by the Arabian physicians, henceforth became the subject of much attention among that restless people, and attacked even their monarchs; for three of the early Caliphs were described as pitted with the small-pox, and one fell a victim to the disease. Many of the Arabians, in the periods subsequent to the Hegyra, wrote at length upon the small-pox and measles, which they carried, in the course of their conquests, not only through Persia, Syria, and Egypt, but eastward along the African coast of the Mediterranean, and ultimately into Europe. Mr. Moore concludes this chapter by some amusing anecdotes, well related, though not very novel, relating to the general history of medicine, rather than to that of small-pox.

In Chapter IV. he describes the "diffusion of small-pox through Europe and America," from the beginning of the eighth down to the eighteenth century. He informs us, in his waggish way, that the introduction of this pestilence, as well as the downfall of the Gothic monarchy, in Spain, was "owing to a rape committed by a king, and to the vengeance of a beautiful woman;" which he illustrates by giving a laconic sketch of the invasion of the Moors, in 710, who established the Koran and the small-pox in that country. From the sterile chronicles of the monks, the only historians of those dark times, little direct evidence, however, is to be obtained of the actual progress of this disease. Military and religious events chiefly occupied their attention, and almost the only disease, which they mention, is *the plague*. But the author here justly observes, that "that word had however a much more extensive signification, than it has since; and was applied *then* to every dangerous epidemic." He adds, in the next page, "but it is quite certain that the small-pox was in those days included among the pestilences. For in the first translations of the work of Rhases, the small-pox is termed *Pestis*; and Constantinus Africanus, as well as many of the early medical writers,

class it with pestilential fevers." And again, "the small-pox being included in the term pestilence, explains satisfactorily why it is not named by the older writers; and also accounts for the very frequent occurrence of the plague in early times." He is hence convinced that some of the epidemics, called the plague, which is said to have visited France eleven times in the ninth, and six or seven times in the tenth century, "were unquestionably the small-pox and measles;" and he is likewise of opinion that the pestilence of the *holy fire*, so terrible and fatal, and so often epidemic, must have been in many instances small-pox or measles.

That this was really the case, there is very little reason to doubt. But surely the same inference is applicable to the more ancient, as to these later periods of time. And if physicians, late in the eleventh century, when the Arabian learning was well known, and especially if such a physician as Constantine, deeply versed in oriental literature, and who had in fact spent thirty years at Bagdad and Babylon, before he settled at Salerno, in the very cradle of the small-pox (according to this doctrine), should still persist in classing this remarkable disease with the plague, ignis sacer, scarlet-fever, &c. under the common appellation of pestilence;—is it surprising, that the earlier physicians, to whom the distinction had not been made manifest, and who have done little more than echo the doctrines of Galen, or that that voluminous theorist himself, who was blinded by his bile and phlegm, should confound them altogether? We know well with what difficulty the human mind throws off the trammels of habit and early instruction. It is scarcely more than a century since the measles and small-pox were allowed to be distinct diseases, and not so long since the chicken-pox was distinguished from the latter; and half a century has not elapsed since the scarlet-fever and malignant sore throat were identified, and since this fever was denominated "putrid measles."—It seems just as probable that the pestilences of Thucydides and Lucretius were small-pox, as any of those epidemics of the ninth and tenth centuries, to which the author has alluded. It is probable, however, that the *holy fire* was a distinct epidemic, differing from small-pox and ery-

sipelas, and resulting from famine, and therefore less common in our times; but it appears to have occurred at a later period, in different parts of the Continent, where it has commonly been ascribed, not to want of nourishment, but to depraved and noxious food, and has received different appellations accordingly. Thus in France, it was called *Ergot*, being attributed to diseased rye; in Sweden, *Raphania*, from its supposed origin from eating the *Raphanus*; and in Germany, *der kriebel Krankheit*. It seems to be a modification of scurvy, and terminates in a dry gangrene.

Believing the small-pox to have been born with Mahomet, at Mecca, in the year 638 or 640, or at least to have first appeared at that time in the west, Mr. Moore has some difficulty in crediting an account, which Dr. O'Conner has quoted from some ancient annals of Ulster; namely, that in 679 the small-pox, (which is called *Bolgach*) was epidemic in Ireland, and again in the early part of the following (eighth) century; a circumstance which is not easily reconciled with the notion that the Moors were the carriers of the disease into Europe above 30 years afterwards. In England, Dr. Short asserts that in 907, the Princess Elfrida, probably a daughter of Alfred, was ill of the small-pox, but recovered; and in 961, Prince Baldwin, of Flanders, her grandson, died of a disease, according to the Bertinian Chronicle, "which physicians called *variola* or *pocca*." This Mr. Moore believes to be the earliest authentic use of these words. And he thinks it "*rather odd*, that the earliest cases of small-pox in Europe, should be those of a British princess and a Flemish prince; as before that disease had reached Flanders, it must have traversed all the intermediate countries from the Mediterranean, and it must have existed some time in the north, before it acquired a Saxon name." (p. 90.) This concluding remark proves that no such oddity here existed; the diseases of princes are likely to be the first that are recorded by historians; but the very fact that the contagion had reached these royal courts, demonstrates, not less satisfactorily than the use of a vernacular name, the previous extensive prevalence of the disease among the people.

This chapter is concluded by some curious medical and historical anecdotes, collected from the saints, and by some statements in refutation of the assertions of Dr. Mead, Baron Dimsdale, and others, that the small-pox was brought into Europe by the returning crusaders; since, in fact, it reached Europe two centuries before the return from these frantic expeditions. In the thirteenth and fourteenth centuries, Mr. Moore finds the disease mentioned in the Lives of the Saints, as well as the blindness produced by it, the curing of which is often stated among the miracles which they performed. And he concludes by observing, that, as in all human affairs good and evil are intermingled, so the invention of the compass, and the discoveries of Columbus, occasioned scenes of misery that never were surpassed; and, among others, the extension of small-pox and measles to another hemisphere. He traces them to St. Domingo in 1517, to Cuba in 1520, and afterwards to Mexico, where in a very short time they destroyed three millions and a half of people. In Iceland and Greenland, the diseases have appeared more lately, but scarcely less fatally. He then sums up these results of his inquiries.

“It may be concluded, from the foregoing historical sketch, that the small-pox and measles had prevailed in China and Hindoostan from remote antiquity, probably upwards of three thousand years; yet had not extended to the more western nations until the middle of the sixth century. About this latter period the above maladies reached the southern coast of Arabia, by vessels trading with India, and broke out near Mecca, during the war of the Elephant, in the year 569, immediately before the birth of Mahomet.

“During the latter part of the sixth, and the whole of the seventh centuries, they were spread, by the Arabians, over the remaining countries of Asia, and all that part of Africa which is washed by the Mediterranean sea. In the eighth century Europe was contaminated, in consequence of the Saracens invading Spain, Sicily, Italy, and France; and the above diseases gradually extended to the north. They had certainly reached Saxony, Switzerland, and England in the tenth, and probably in the ninth centuries. And lastly, in the beginning

of the sixteenth century, twelve years after the death of Columbus, the infections were transported by the Spaniards to Hispaniola, and soon after to Mexico, and diffused speedily over that hemisphere also." p. 110.

In Chapter V. Mr. Moore details, with considerable erudition, "the various theories and treatment of the small-pox from its appearance in Arabia, to the fifteenth century," beginning with Ahron, who wrote subsequently to the epoch of the Hegyra, (622), but whose works are lost, except some fragments preserved by Rhazes, and ending with Arnold of Villanova, Gilbertus Anglicus, and John of Gaddesden. The author appears to have examined the works of all these authors with great industry, and he has detailed the principal doctrines and methods of treatment, which they have respectively adopted with respect to the small-pox, as well as the leading circumstances of their lives and characters; so that this chapter is a neat but comprehensive compendium of the medical history of Arabia, and is enlivened by many judicious remarks on the peculiar merits and imperfections of these writers, as well as by various anecdotes not immediately connected with the small-pox. The minute and amusing account of Arnoldus de Villanova evinces, among others, the zeal and success with which Mr. Moore has sifted the writings of these ancient authors. The most curious parts of the voluminous works of this writer, as well as the works of John of Gaddesden, are those which relate to the various subjects on which they appear to have been consulted by both sexes, relative to the improvement of their mutual attractions. Arnold treated of sorcery, too, as of a malady in the physician's province; and describes many witcheries, and the potent spells by which they may be overcome. The terror of cold, which was strongly inculcated by the first writer on small-pox, Ahron, upon hypothetical principles, was not less carefully inculcated by all subsequent writers down to Sydenham; and John of Gaddesden and his contemporaries ascribed much efficacy to every thing *scarlet*, probably from its fiery hue.

Chapter VI. is headed, "From the fifteenth to the middle of the seventeenth century. Fire, philosophy, and the alexi-

pharmic treatment." The author has here shewn the same able discrimination of character, in his biographical sketches of the writers, whose doctrines he briefly describes, and characterizes by some pointed quotation or appropriate anecdote, as well as the same intimate acquaintance with their works. Fracastorius, Paracelsus, Fernel, Forestus, Mercurialis, Senner-tus, Van Helmont, Willis, Riverius, Diemerbroek, Kircher, Sylvius, and some others, are thus passed in review, with an account of their opinions and practice in respect to the small-pox.

In the VII. Chapter, the author treats of "the cold treatment.—Sydenham, Boerhaave." Between these two luminaries of medical science, he has also given brief accounts of the opinions of Etmuller and Doldus. His biographical sketch of Sydenham is short, but his detail of the particular improvements in the treatment of small-pox, which Sydenham introduced, is very copious, and he justly laments the hypothetical error, of bleeding in the last stages of confluent small-pox, into which that able physician fell. Boerhaave admitted that the history of small-pox and measles, which Sydenham left, could not be improved; but from his general reasonings on febrile diseases, he had the merit of introducing two essential improvements on the practice of that author, the exhibition of aperients in the beginning, and changing the antiphlogistic for a cordial regimen towards the conclusion of the confluent small-pox.

In the three following chapters, the author has given an animated account of the discovery and progress of inoculation, from the Chinese custom of *sowing* the small-pox, down to the improvements made by the Suttons, Dimsdale, and others; together with a detail of the controversies which it excited, and of the various publications, religious and medical, to which it gave rise in this country. And in the eleventh, and last, chapter, he treats of the opinions of Dr. Cullen, and of the final treatment in which physicians at length terminated their dissensions. Mr. Moore then inquires into the result of the labours of twelve centuries to remedy this malady; and confesses that the view is rather mortifying to a medical phi-

losopher. The immense general mortality, however, he justly remarks, is not disgraceful to the art of medicine; because in individual cases the fatality of the disease has been much diminished by the improvements in practice, and especially by inoculation, and indeed in no disease perhaps has the salutary influence of medicine been more conspicuous. For in countries where ignorance of the disease prevailed, the small-pox has proved a most fatal pestilence; but here, a very large proportion of the community, who submitted to professional instruction, have escaped all the calamities incident to the disease. The mischief has arisen principally from the difficulty of inducing all persons to resort to inoculation; and under that impossibility, it has been increased from the want of some laws of exclusion, analogous to those of quarantine, by which those, who produce the disease by inoculation, should be prevented from exposing the inoculated persons in the way of those who are liable to the infection. A recent decision in the Court of King's Bench, however, has shown, that such an exposure, where it produces the disease in others, is a misdemeanour by common law, and a medical practitioner, and an ignorant mother, have recently been subjected to imprisonment for being guilty of this act. We submit to the most severe laws of quarantine, for the sake of evading the introduction of foreign contagion, (laws which allow any individual to take the life of a person seen in the act of breaking them) and there seems no sound reason why we should not guard against the wilful propagation of domestic contagion, by a law which should preclude all persons infected with the small-pox from mixing with the public.

"Some opposition," says the author, in his concluding paragraph, "might be expected from those who live by spreading contagion among the community. But there are a set of men whose immoral conduct merits rather the castigation of the magistrate, than the consideration of the legislature. And few even of them would have the effrontery to raise objections to a statute for extinguishing the most fatal pestilence that ever preyed upon man; which, like the benign law for abolishing the slave-trade, would reflect lustre on the mover, adorn the

annals of parliament, and add grace to the sovereign; and would likewise form (though it may spoil the climax) the most agreeable conclusion possible to the eventful History of the Small-Pox."

The foregoing sketch of the contents of this work will afford some idea of the very complete view, which the industry and ability of the author have enabled him to present, of the evidence which is extant respecting the progress and treatment of the small-pox; but it will afford no adequate impression of the various collateral information, connected with medical history, with which it abounds, and of the sprightliness of the manner in which it is detailed, both of which contribute to extend its interest beyond that of the medical reader.

Reports of the Pestilential Disorder of Andalusia, which appeared at Cadiz in the Years 1800, 1804, 1810, and 1813; with a detailed Account of that fatal Epidemic, as it prevailed at Gibraltar during the Autumnal Months of 1804; also Observations on the Remitting and Intermittent Fever, made in the Military Hospitals at Colchester, after the Return of the Troops from the Expedition to Zealand in 1809. By Sir JAMES FELLOWES, M. D. &c. &c. pp. 484. London, 1815. Longman and Co.

[From the Edinburgh Medical and Surgical Journal, for January, 1816.]

THIS work comes from the very highest authority, not only on account of the professional rank of the author, but much more on account of the zeal with which he availed himself of his opportunities of examining minutely the subject on which he writes. Sir James Fellowes has divided his book into five Reports. The first relates to the fever which prevailed in Cadiz in 1800; the second to that of Gibraltar and Malaga in 1804; the third to the fever of Cadiz in 1810; the fourth to that of 1813 in the same city; and the fifth Report relates to

the Walcheren fever, as it appeared in Colchester in 1809. To these are added a Conclusion, and eight Appendices.

Sir James Fellowes had been with Admiral Christian in the West Indies, and had had only too many opportunities of witnessing the pestilential fever which committed such ravages among our soldiers in St. Domingo. He is therefore good authority, when he describes the peninsular fever as "appearing under a similar form of malignity, and showing many of the strongly marked characters of the St. Domingo fever." Upon this point, and indeed upon almost every point, Sir James entertains opinions nearly similar to those of Mr. Pym, and, like him, strongly combats the account which Dr. Bancroft has given of the origin and mode of propagation of these diseases. Indeed, it is impossible to deny the contagious nature, at least of the peninsular fever, after having perused the documents collected by Sir James Fellowes. Whether he has been successful or not in tracing the introduction of the fever into particular places, we shall not stop to inquire. However satisfactory the proof of such a fact might be, it is almost impossible to ascertain it, so as not to admit of explanation in controversy; and, in disputing about circumstances of very secondary importance, we lose sight of the much more conclusive evidence derived from an extended view of the whole. Although we have so lately expressed our sentiments on the subject, we cannot refrain from confirming them by some general arguments derived from the perusal of the instructive volume before us.

The first is the total disproportion between the increased number of deaths, and any supposable increase of any alleged endemic cause. Even if it were ascertained that the weather in these destructive years was somewhat hotter or colder, or drier or moister than usual, we should only expect the endemic diseases to be proportionally more severe and more numerous than usual; at the most we should expect a very unhealthy year; but the change in the peninsular diseases was not in degree, it was in character. It was not merely that a much greater number of people were attacked, and that of these a much larger proportion died, but we find that, in these

pestilential years, few escaped, and of those attacked the mortality was excessive. In Cadiz, in 1800, the population was 57,500; 48,520 were attacked, and 7387 died, while the average deaths in a year did not exceed 2616; in Seville the population was 70,488; 61,718 were attacked, and 16,685 died; and in Gibraltar in 1804, the garrison consisted of about 4000 men; in the monthly return for August there were 83 sick, in that for October there were 565. The average deaths among the military in a year were 72; during the Duke of Kent's command only 39 in two years; during the epidemic, in four months, 918 died, and 164 of their wives and children; while of 14,000 inhabitants only 28 escaped the disease, and 5028 died.

The next general argument is derived from the history of the various epidemics of this disease which have been observed in the peninsula. Its recent introduction, the distant periods at which it has appeared, the partial, and, if we may use the word, desultory, manner in which it has affected the peninsula, all militate strongly against its endemic origin. Before the commencement of the 18th century, Spain had been repeatedly visited by the plague derived from Barbary or the Levant, which confined its ravages to particular places, or extended them more widely, as more or less care was taken to prevent all intercourse with infected places.

In 1730, the disorder since known by the name of *El vomito negro*, or black vomit, first made its appearance in Cadiz, and destroyed

“Great numbers of persons, very few having escaped who were attacked by the disease. In the year following, it prevailed with equal fury, and spread general alarm throughout the country; two symptoms were particularly noted as being most fatal in this disorder, which had not been before observed in Spain; viz. spots of a livid, yellow, or dark colour, that covered the body, and were the certain forerunners of the black vomit: the physicians were of opinion, that the malady was of a pestilential nature, and they advised the magistrates to take the necessary precautions.”

It was said to have been introduced by a vessel from Spanish

America, and that it spread to other parts of the peninsula. The year 1730 was remarkable for its drought, which was supposed to have caused the influenza then prevalent.

The *vomito negro* appeared for the first time in Malaga in 1741, and it was also said to have been introduced there by a vessel from South America. It carried off upwards of 10,000 persons. It again appeared in 1764, but was confined to Cadiz, nor even there was it very fatal or general. The preceding spring and summer had been remarkably dry. This epidemic has been briefly described by Dr. J. Lind, whose opinion was, "that the fever may be communicated by contagion, but that this contagion is very slight, unless co-operating with a bad air, and in a ship is often greatly checked, if not wholly destroyed, by going out into the open sea."

It again appeared in Cadiz about the beginning of August 1800, in the Barrio de Santa Maria. Although at first confined to this district, it continued daily to gain ground; but, on the 5th of August the people went in procession through the town to appease the supposed anger of the Deity, and in five days time, cases of fever were reported in the other Barrios. About the middle of September the deaths amounted to 200 daily. In October the mortality began to diminish, and on the 12th the city was declared to be healthy. Towards the end of August the neighbouring towns were not yet infected; but about that time it reached Isla de Leon, Port-Royal, Chiclana, Puerta de Santa Maria, St. Lucar, and Rota. It also committed dreadful ravages in Seville and Xeres, but did not extend beyond the Sierra Morena. During the years 1799 and 1800, the true plague almost depopulated the states of Barbary, which caused the Governor of Gibraltar to establish regulations and measures of precaution, for the safety of the garrison; which, in fact, remained perfectly healthy, with plague on the one side, and yellow fever on the other.

In 1801, the yellow fever appeared at Medina Sidonia, but soon ceased, and extended no farther.

Toward the end of August 1803, it broke out in Malaga, and carried off great numbers. It declined as usual in the month of December, but only to burst forth with increased vi-

ruled early in the summer of the following year; and, upon this occasion, it extended its ravages in every direction. The cities of Cordova, Granada, Velez Malaga, Carthagena, and Alicant, on the east-side of Spain; Antequera, Cadiz, and the towns on the west-side, as far as Ayamonte, were severally attacked. It also affected Leghorn, but no other part of Italy, and the lofty fortress of Penon de Velez on the north-west of Africa. At last our own fortress of Gibraltar was doomed to suffer severely, and the 28th of August 1804 is fixed upon as the day when the first case occurred. With the approach of the cold weather, it once more ceased all over Spain for some years.

In 1810, Cadiz was once more attacked, about the 11th of September; great mortality from the ship or jail fever having taken place in the early part of the year among the French prisoners of Dupont's army confined on board hulks. This year it was confined within the walls of Cadiz, on this side of the peninsula, and even spared the Isla de Leon, to which the British troops had been removed on the first intelligence of the disease having reappeared; but it prevailed at Carthagena, and slightly at Gibraltar; and about the 16th or 18th of October, in the distant island of Teneriffe, but did not extend to any other part of the Canaries.

The kingdom of Murcia continued to suffer in 1811, when the rest of Spain was healthy.

Early in September 1813, the last peninsular epidemic which we hope it will be our duty to record, began in Cadiz, from whence it spread to Port St. Mary's, and several other places, to which the emigrants from Cadiz retired. Gibraltar was also visited by it this season.

When we carefully consider this chronological notice of the epidemics of the peninsula, which it has cost us some trouble to extract from the publications of Sir James Fellowes and Mr. Pym, and trace their progress upon the map, connected with the local circumstances of the places, whether infected or healthy, it seems to us impossible to account for its progress upon any general principle of peculiarity of local circumstances, or atmospheric influence, independent of contagion.

The third general argument, and one perhaps still more conclusive, is derived from the effect of quarantine and seclusion, in preserving places or individuals from the disease when it was prevalent, and of separation of the sick in putting a stop to its further progress. Sir James Fellowes's Reports abound with the most striking proofs of this fact, and to them we must refer our readers. We shall only extract one or two.

When it prevailed in Murcia, in 1811, the French drew a cordon of troops around the infected district, and it did not extend beyond it. (p. 239.) In 1810 and 1813, when the French occupied Malaga, and had little communication with the surrounding country, Malaga remained healthy. Many cities, as Aguilar, (p. 195,) Xeres, (p. 291,) remained free from the disease, while it extended to others much more remote, where no precautions were taken. Even in infected towns, those who avoided communication with the diseased escaped, as exemplified in the case of the convicts in Cadiz, and of the workmen in the dock-yard at Gibraltar.

The last argument is the counterpart of the former, the numerous proofs of its being directly conveyed or communicated by personal intercourse, when no other circumstance seemed to favour its propagation. Of this it is sufficient to notice its appearance in 1804, in the fortress of Penon de Velez, on the northern shore of Barbary, distant in regard to situation, but receiving all its supplies from Malaga, while no other part of Barbary suffered from it. The instances in individuals adduced by Sir James are very numerous and striking.

We have entered much more at length than we intended into the proofs of the contagious nature of this disease, because we consider the establishment or refutation of that point to be of the very greatest practical importance.

Sir James also confirms, by many instances, the curious fact which we first learned from Mr. Pym, but which seems to have been observed very soon by the Spanish physicians, that this disease attacks persons but once in their life.

“Professor Arejula closes his observations with the following remark:

“The yellow-fever of Andalusia only attacks persons once

in their lives, and it is of great importance for the physician to know this, in order to form his prognostic and his plan of cure, as well as for the individual who may have passed through the disorder, that both of them, being assured of this fact, may step forward without fear to the relief of their fellow-creatures who may hereafter be afflicted with so dreadful a malady."

Sir James Fellowes has prefixed to the account of each epidemic, an excellent medical topography of the places where it prevailed; and, in the appendix, has given an account of the climate and weather, founded on the most accurate meteorological observations. For many valuable remarks on the nature and symptoms of the disease itself, especially as assisting us in forming our prognosis, on its pathological effects, and its method of treatment, we must refer to the work itself. Besides his personal experience, his work contains a great deal of useful information, derived from the best publications by the physicians of Spain, whose individual merits Sir James was well qualified to appreciate.

The fifth report contains

"Observations on the bilious, or autumnal remitting and intermitting fever (called the Walcheren fever), with remarks on the treatment of the disease, as it appeared in the military hospitals at Colchester in the months of September, October, November, and December, 1809."

It does not admit of analysis, but contains many excellent observations, of which we shall select a few. First, in regard to the prevention of the disease.

"On referring to the returns of the sick that came under his charge to England, Mr. Jones informed me that he observed one company of the right wing bore no proportion to the others, having only *one* man ill; and on enquiring into the cause of their exemption from disease, it was found, that, when the troops entered their cantonments, strict orders had been given to prevent their smoking in any of the barns, for the fear of accidents from fire.

"In consequence of this order, it was customary for the men in the evening, after they had thrown off their accoutre-

ments, and many of them part of their dress, to take their pipes and sit under the trees, or rest themselves in other open and exposed situations, where they enjoyed the conversation of their comrades, in some instances probably to a late hour; whilst the men belonging to the company alluded to, being quartered in rather a better description of house, were in the habit of smoking their pipes in a *large kitchen*, with the servants of the Dutch family; *here they were sheltered from the exhalations* so prejudicial to health in such climates and under such circumstances, when the constitution was more liable to be acted upon, viz. in a state of inactivity after fatigue or exercise." p. 343.

"The interesting observation communicated by the surgeon of the 43d, of the comparative healthy state of the company of the right wing over all the others in that regiment, is highly deserving of attention; more real advantage may be derived from the knowledge of a single fact, so stated, than from volumes written expressly on the subject of military diseases: it shews how much depends on the attention of commanding and medical officers of regiments to all the minutiae connected with their interior economy.

"It was to be regretted that the troops were taken out to exercise before sun-rise. The danger of allowing the men to be *under arms every morning an hour before day-light*, does not appear to have been considered; and it is extraordinary, that after all that had been written upon the subject of preserving the health of soldiers in such unwholesome climates, no precautions seem to have been taken to *guard* against the fatal consequences of exposure to the damp and noxious exhalations." p. 345.

Next, in regard to the cure,

"From the appearances which were observed in these dissections, we were led to draw the following conclusions; that the original disorder was of an inflammatory nature, inducing a considerable vascular excitement and determination to particular organs, especially to the liver and spleen, and that the derangements in their functions occasioned those *relapses* or subsequent returns of fever which took place at distant pe-

riods and at lengthened intervals, from the original or primary attack.

“In fact, we found that no radical or perfect cure could be obtained until the congestions which had been formed in those important organs were either *lessened* or removed; and by keeping in view the connexion that subsists between the bilious remittents of warm climates, and the remitting and intermitting fevers of our own latitudes, in which derangements in the bilious secretions are so remarkable, a correspondent plan of cure was adopted, and was attended with the happiest result.” p. 360.

“The general plan of treatment at first, was to open the body by means of five or six grains of the submuriate of mercury, with an equal quantity of c. ext. of colocynth, followed up by the senna infusion, and sulphate of magnesia, after which the submuriate and antimonial fluid were given every three or four hours in small doses, and continued, either with or without mercurial friction upon the side, according to the state of the patient and the period of the disorder, or until the mouth became *slightly* affected.

“The warm bath, fomentations, and blisters to the side were also employed, together with an anodyne draught, and occasionally the camphorated mixture, with acetate of ammonia, &c.

“In the *most obstinate cases*, it was found necessary to push the mercurial friction to some length, so as to induce ptyalism; and when there was appearance of remission, the *bark* was given, and *not till then*, in the form of decoction, with an aromatic; *wine* was also allowed in small quantities according to the strength of the patient.

“This was the usual method we followed throughout the month of September; but in October and November we had occasion sometimes to use the lancet; and in the cases of *relapse* particularly, the best effects seemed to follow the loss of blood.

“As we had reason to suspect that these attacks of fever were connected with abdominal inflammation, cupping-glasses were employed in preference; and after fomenting the parts,

they were applied either to the region of the stomach, liver, or spleen, where the pain was most complained of, and great relief invariably followed from this topical bleeding." p. 363.

"When Sydenham complained that he knew of no successful method of treating intermittents, as the *bark*, which had always had the appellation of a specific, rather checked their progress than removed the cause of the disease; those congestions were not suspected which have been shown to exist to a great degree in consequence of the strong determinations to the viscera, which very early take place; and it was not likely that the disorder could be radically cured, until the irritation which they occasion in the system was entirely removed.

"It is not however by *throwing in mercury, and pouring in the bark*, that this effect is to be produced; these are terms to be met with in some late writers, and they are not less improper than the indiscriminate and empirical manner in which those invaluable medicines have been employed.

"The smallest quantity of mercury will often (as it is well known) affect some constitutions so speedily, that it is impossible to lay down any rule for its administration in these fevers.

"I have generally found great advantage to result from its being introduced gradually into the habit, and its action to be rendered more certain by being given in small doses, and at distant intervals." p. 283.

"In the distribution of the extra diets, or what are termed *medical comforts*, a discretionary power was given to the medical officer in attendance; but one general principle was admitted by all, and acted upon throughout the establishment; that *wine and spirits* were not found to be *absolutely* necessary to the removal of the *Walcheren* fever, as it was called; and that, during the *progress of convalescence*, the management and *quantity of diet* was to be considered of the highest importance in effecting a perfect recovery. A very contrary opinion had long prevailed, and it is the popular one in the army, that the British soldier required more nourishment and more animal food than those of other countries, and hence arose the

profuse and liberal allowance of every article that could be thought of, which tended rather to satiate, than to satisfy the appetites of persons recovering from acute disease." p. 332.

On Gun-shot Wounds of the Extremities, requiring the different Operations of Amputation, with their After-treatment: establishing the Advantages of Amputation on the Field of Battle to the Delay usually recommended, &c. &c. &c. With Four explanatory Plates. By J. G. GUTHRIE, of the Royal College of Surgeons, London; Deputy Inspector of Military Hospitals. 8vo. pp. 384. Longman and Co. London, 1815.

[From the Edinburgh Medical and Surgical Journal, for April 1816.]

OF this book we may with truth say, "Indocti discant, et ament meminisse periti." The experienced and intelligent surgeon will have pleasure in acknowledging the interest with which he has perused it; but to the junior and less experienced members of the profession, and especially to the younger military surgeon, this treatise of Mr. Guthrie must prove an invaluable gift. A work of this kind was, in truth, wanted for their instruction; and the *desideratum* has been most happily supplied, not by an ordinary surgeon, but by one bred in the camp and in the field of battle. The reader, too, is introduced to this great school of military surgery, and becomes accustomed to its horrors, its dangers, and privations. But, amidst the difficulties and privations of active campaigns, it is delightful to observe with what order and precision the medical arrangements have been conducted during the dreadful war of the peninsula; and to learn that our brave troops had the advantage of being succoured by surgeons of first-rate talents and acquirements. Such, indeed, appears to have been the zeal and talents of the more experienced surgeons of the staff, that the camp and field were converted into schools for the

instruction and training of the younger medical officers, by all the aids of lectures and demonstrations. And, though we know that almost all the medical recruits who were sent out to the army had received what is called a regular and liberal medical education, and had not received their certificates or diploma till after a regular inquisitorial examination, though many had received even the highest honours of medicine, yet the lectures and demonstrations of the camp were necessary to make them actual surgeons, and they soon became excellent.

Military surgery, like military success and glory, is indeed of late date amongst us; and, to judge from the specimen before us, we think we have now no less reason to be proud of the one than of the other.

The practical conclusions of this interesting volume Mr. Guthrie disclaims as exclusively his own; and he wishes them to be considered, in every thing that is useful, as the result of the general experience of the British military surgeons who have served in the late campaigns.

One of the most important questions in the department of military surgery is that so often discussed, with regard to the proper period for amputating—whether, when such operations are necessary, they ought to be performed on the field of battle, immediately or soon after the injury received, or not till after the removal of the wounded into hospital or quarters, and when the first train of supervening accidents have been subdued.

The whole merits of this hitherto disputed point are most ably investigated by our author in his first section; but the question seems now finally determined, by the experience of military surgeons, in favour of early and immediate amputation, when the limb cannot otherwise be saved. Wiseman, Le Dran, and Ranby, who learned their surgery in the field of battle, are all advocates for immediate amputation; and, perhaps, with the exception of Bilguer, the opposite seems to have grown up with, and to have been defended, chiefly by men of

limited experience in military surgery. At the beginning of the wars which have for some time past desolated the fairest parts of Europe, both the Continental and the British surgeons rather inclined to the side of delay; but experience has now taught both the French and the British surgeons the advantages of operating on the field of battle.

The objections made to this appear to have been founded chiefly on theoretical grounds;—these are examined and refuted in a very luminous and satisfactory manner by Mr. Guthrie; but the argument drawn from actual, extensive, and general experience, is so paramount, as to render all other exposition of the merits of the question most unnecessary in this place.

At first sight, indeed, it is obvious that, if a man must lose a limb, he had better lose it immediately, than after three or four weeks of pain, and suffering, and fever, and inflammation, suppuration, gangrene, and danger. It is certain also, that, in this struggle, many would die before the period of his last chance for recovery by amputation could arrive; but even this period, when the patient has survived and attained it, is less favourable for the operation than the moment when the accident was received; and, of any equal numbers of operations performed, the one number on the field of battle, and the other at the secondary period, it appears in evidence, that a far greater proportion of the former recover than of the latter. As the most satisfying proof of this leading fact, we shall content ourselves with exhibiting the following tables from the book now before us:

“Return of the capital operations performed at the hospital stations, between the 21st of June and the 24th December, 1813, of the army under the command of his Excellency Field-Marshal the Duke of Wellington; being a period of six months, from the advance of the British army from Portugal, until its establishment in winter quarters in front of Bayonne.

	Number operated upon.	Of which died.	Discharged, cured.	Under cure.
Amputation of the upper extremities,	296	116	105	75
Lower extremities,	255	149	65	41
Total number of operations,	551	265	170	116

The operations at the shoulder-joint not included.

“Return of the capital operations performed in the same period on the field of battle, and for the most part kept in regimental and divisional hospitals.

	Number operated upon.	Of which died.	Discharged, cured.	Under cure.
Amputation of the upper extremities,	163	5	64	94
Lower extremities,	128	19	43	66
Total number of operations,	291	24	107	160

“The cases marked “under cure,” in both statements, having passed the period of danger, are considered as recovered; and from this it will appear that the comparative loss, in the secondary or delayed operations, and primary or immediate operations, is as follows:

	Secondary.		Primary.
Upper extremities,	12	to	1
Lower extremities,	3	to	1

"This difference is certainly very remarkable, and it is so well known to all the surgeons of the British army, as a constant occurrence, that there is no longer among them any doubt on the subject; and the following statement of operations performed on officers and soldiers, in consequence of the battle of Toulouse, will probably be even more satisfactory; as the medical duties both in the field on the day of action, and in the hospitals afterwards, until the final evacuation of Toulouse, were more immediately under my observation and control.

"Primary Operations on the Field of Battle.

	Number operated upon.	Of which died.	Cured.
Upper extremities,	7	1	6
Lower extremities,	40	8	32
	—	—	—
Total of primary amputations,	47	9	38

"Of the eight that died of amputation of the lower extremity, three were shortly after the operation; which was performed as high as possible in the thigh by the circular incision, and one officer.

"Secondary or delayed operations in General Hospital.

	Number operated upon.	Of which died.	Discharged cured, or considered out of danger when transferred from Toulouse.
Upper extremities,	15	3	12
Lower extremities,	36	18	18
	—	—	—
Total of delayed, or secondary amputations,	51	21	30

The reasons of this difference of success are, that, in the primary operations, the amputations have been performed on a healthy subject, and on sound soft parts; and hence the

stump generally heals by the first intention, and without accidents. In the secondary amputations, on the contrary, the health has been broken by much suffering for three weeks, or more; and the soft parts which are cut by the surgeon have been altered by inflammation; hence the stumps seldom heal without suppuration; often they ulcerate; and sometimes the limb becomes gangrenous, or the patient is attacked with fever, and dies from internal suppurations.

On the subject of gangrene we have also some excellent and judicious observations from Mr. Guthrie; and especially from one kind of gangrene peculiar to gun-shot wounds of the extremities,—that which is the consequence of the wound of the principal arteries of a limb. The gangrene in this case commonly begins in the lower part of the limb, below the wound, perhaps in the toes and fingers, and spreads upwards; and the experience of Mr. Guthrie leads him to conclude, that this case forms an exception to the general rule of waiting in gangrene for the line of separation, before proceeding to amputate.

“Having lost all the cases of gangrene succeeding to wounds of arteries, and other cases of greater injury, in which it supervened on the third or fourth day without much previous inflammation, I began to think it an error to wait for the line of separation, when there appeared but little prospect of its formation. In two cases after the battle of Salamanca, in which I had reason to think the gangrene was of this kind, I amputated with success; a third died after amputation, but not of gangrene affecting the stump; and a fourth and fifth, which I left for the appearance of the line of separation, or the cessation of the gangrene, very soon died. This practice, in cases of severe injury, after gun-shot wounds, has succeeded in the hands of others, even in England.”

After discussing all the questions and points of practice connected with amputations, generally as connected with gun-shot wounds, Mr. Guthrie proceeds, in distinct sections, to the consideration of the particular operations.

Under each head he not only describes the modes of operating, but, with a freedom and ability which experience alone

can give, he points out the nature, variety, and extent of those wounds and accidents which require the operations in question. These observations are most valuable and instructive, but scarcely admit of abridgment or analysis; and this is a book which we are most unwilling to save any one the trouble, we ought rather to say, the pleasure and profit of perusing. The account of the operations performed at the hip and shoulder-joint, are especially interesting. The former operation has been more than once performed by Mr. Guthrie, and other British surgeons; we regret to add, that in one case only has it been completely successful. But this one is sufficient to justify an operation from which surgeons in general have shrunk. The operation of the shoulder-joint has become as perfect and as successful as any other operation.

A surgeon in private practice, who performs a few annual and great operations, is still timid and apprehensive, compared to the military surgeon; and there is nothing more worthy of a passing remark, than that confidence and intrepidity which the military surgeon acquires, and which is in truth so necessary for him to have in the discharge of his important and arduous duties. Mr. Guthrie has no silly fears of hæmorrhagy and uncompressed arteries, in cases where experience has taught him confidence. He cares not, indeed, in most cases, whether he has a tourniquet or not; an instrument which in some cases is, indeed, useless, as in operations at the great joints. In these he trusts with the most perfect confidence to the manual compression of the artery above the clavicle, and on the brim of the pelvis.

“The fear usually entertained by surgeons, is that of uncontrollable hæmorrhage; and Mr. John Bell (whose works have done so much good in the surgery of arteries), has here done much mischief, in persuading many young men that hæmorrhage from large arteries is not to be restrained by any pressure; which is, in my opinion, one of the principal errors of his work, in relation to military surgery, and is indeed almost as great an error as any he has laboured so effectually to overturn.

“He says, p. 415 of his *Principles of Surgery*, ‘I will re-

peat with confidence what I have frequently affirmed, that it is one thing to suppress the pulse in the lower part of the limb, and another thing to stop the pulse in the great artery. I have tried in great operations, near the trunk of the body, to stop the blood by pressure; but though I could suppress the pulse of the femoral artery with my fore-finger, I could not command its blood with the whole strength of my body.' And in a note he says, 'the fact which I have here affirmed is of too much importance for me not to maintain it with more than common earnestness. I affirm then, that, though the throbbing of an aneurism, or the pulse in the lower part of a limb, be quite suppressed, yet the circulation is not stopped; and I entreat the young surgeon never to trust to any such mark of the compression being effectual.'

"If he wish it to be understood, that the inguinal, or the subclavian artery, cannot be commanded by any pressure, so as to prevent hæmorrhage on their division, it is merely advancing an opinion, that hardly needs a comment; for almost all the medical officers of the British army have, on many occasions, seen both vessels so effectually compressed by moderate pressure, that not one drop of blood has escaped from the orifice of the artery, after it has been divided. I am, therefore, willing to believe that this cannot be his meaning, but that he supposes a certain degree of pressure may stop the pulsation of the artery without suppressing the circulation; an opinion equally as dangerous, and erroneous, as the other; for it tends to keep the mind of the young surgeon in alarm, and thereby obstructs the free exercise of his judgment, during the whole course of many serious operations, when he often requires the greatest firmness to enable him to surmount the difficulties that present themselves. This alarm is most unnecessarily raised, for I have no hesitation in declaring, and I am supported in the assertion by all the surgeons of extensive practice in the British army, that when the pulse is suppressed in a great artery, the flow of blood is completely restrained for every purpose in military surgery. I will even say, that the flow of blood shall be entirely suppressed, and yet the pressure upon the subclavian artery above the clavicle, shall

be so moderate, that the instrument will not leave a mark upon the skin discoverable after twenty-four hours. I do not assert this without solid foundation; for I have seen the inguinal and subclavian arteries compressed and divided very many times, and I have had the femoral and axillary arteries as often between my fingers; but I never saw blood projected one inch from the orifice of these vessels without the pulsation or motion of the artery taking place; and I never saw blood flow in a stream from the orifice of any large artery. I have seen, when the sides of these vessels have not been pressed exactly together, so that the inner coats have not been in contact, that a little blood has oozed to the mouth of the artery, and that it has even dropped from it; but the moment this drop became a stream, the pulsation of the artery was sensible to the fingers, and the blood thrown out, came *per saltum*. I have never found any difficulty in holding the divided end of the femoral or axillary arteries, between my finger and thumb, whilst a ligature has been placed upon them; and I do not, therefore, believe, that the blood is propelled in these arteries with a force that is not readily overcome by moderate pressure; or that in a healthy man, any circulation goes on in an artery, when the pulse of that artery has ceased in consequence of pressure. It is not, indeed, consistent that it should; for, if the circulation can go on so as to cause a dangerous hæmorrhage, without any pulsation of the artery, the continuance of it in the smaller arteries in a state of health, would almost appear unnecessary. If it be said that it is not circulation, but merely a little blood that passes between the sides of the vessel that are not exactly in contact; I would reply, that if such an occurrence did take place, the quantity must be so small as to be unworthy the attention of the surgeon; for, if it were in greater quantity, it would be attended by pulsation of the artery.

“I do not mean, in the slightest degree, to doubt the correctness of Mr. Bell’s statements of his inability to suppress the circulation in the cases of aneurism he has adduced. I mean to assert only, that the passage of the blood through a healthy artery can be effectually prevented by moderate pres-

sure; that when the pulse has ceased in a large artery in consequence of this pressure, the circulation is suppressed for every purpose in surgery; and that the surgeon may, therefore, divest himself of all fear of hæmorrhage. It is, indeed, a fact so notorious in the medical department of the army, that I need not have noticed it thus particularly, if I did not think the great authority of Mr. Bell's opinion might prevail when the practice of the peninsular war shall be forgotten."

The various doctrinal and practical discussions in which Mr. Guthrie engages, are illustrated and enlivened by a variety of cases, and observations of the highest interest.

Such a book, in short, as this, was wanted; and we now have one which ought to be in the hands of every military surgeon.

A Treatise on the Puerperal Fever, illustrated by Cases, which occurred in Leeds and its vicinity, in the years 1809-1812.

By WILLIAM HEY, Jun. Member of the Royal College of Surgeons in London, and Surgeon of the General Infirmary, and of the House of Recovery, at Leeds. 8vo. pp. 238. London, 1815, Longman and Co.

[From the Edinburgh Medical and Surgical Journal, for October, 1815.]

WE have been much interested by the perusal of this very able and instructive volume. It exhibits the most demonstrative evidence of the propriety and success of a simple but decided practice, in this severe and dangerous malady; at least in the particular form of it which occurred at Leeds during the periods specified in the title-page. We say in this particular epidemic, perhaps rather in conformity with established opinions upon this subject, than consistently with the impression which the perusal of this work has left upon us. For when we add the testimony of Mr. Hey to that of Drs. Gordon and Armstrong, and still more, when we examine the nature of several of the cases related by the former in this

work, we feel disposed to doubt the propriety of the distinctions made by many writers, between the epidemic and sporadic disease.

It appears to us to be an obvious inference from the different views which practitioners and authors now take of many febrile diseases, either that the older physicians of the last generation were mistaken in their apprehensions of putridity and debility, or that the diseases of this country have actually undergone a considerable alteration in their type and character. We are disposed to believe, indeed, that there is some foundation for both these suppositions. We cannot doubt that the hypothesis of debility, and the practice of stimulation, were carried to a much greater length than sound observation would have justified; and that many of the effects ascribed to debility, were in reality the result of over-excitement, not checked in the outset by evacuations, and rather aggravated than diminished, by the cordial system which was afterwards employed. But, on the other hand, there appears to be sufficient evidence of some actual change in the character of febrile diseases since that period, dependent upon other causes than a change of medical treatment, and probably itself in part the cause of this change of medical opinion. It seems to be well ascertained, that petechial fevers have every where in a great measure declined in this country, though thirty or forty years ago they were extremely prevalent in jails, hospitals, and ships, and in the habitations of the poor. At present such fevers are rarely seen, even in the prisons and fever-hospital of London; see Willan on Cutan. Disorders, where he quotes the authority of the surgeon of Newgate, and the physician of the House of Recovery, 2d edit. p. 469; and the experience of practitioners in general will confirm the general fact. Whether these changes are inexplicable upon any known facts, (for we cannot ascribe them with Sydenham to occult changes in the bowels of the earth); or whether they are explicable upon the general improvement of the country in cleanliness, ventilation, temperance, and a better diet, which increasing wealth has introduced, we do not pretend to determine; but as facts we think they must be received. The con-

stitutions of the people seem to have acquired somewhat more of a phlogistic diathesis, and to bear and require less of the stimulant treatment to which they were formerly subjected, and a more general evacuant plan. We wish to persuade ourselves that this view of the subject is true, for the credit of the art; for if it is not, the practice of medicine must be a farce, or the former practice must have been productive of extensive injury. We are certain, at least, that in most of our febrile diseases, the dread of *typhus* and malignancy is now a bugbear, and that the cordial treatment is generally manifestly injurious.

The judicious author of this treatise has stated, in the most philosophical manner, the series of facts which the occurrence of an epidemic brought under his observation, adopting no theory, and using no hypothetical phrases, respecting the nature and seat of the malady; but giving a plain and inductive comment upon the obvious results of the expedients resorted to, and the natural course of events when these expedients were omitted. Insomuch that, as we have already observed, his evidence amounts as near to demonstration as experiments in pathology will admit of; and we can scarcely dissent from his inference, that much mistake has been committed in supposing that puerperal fever, when epidemic, was to be treated, in any instance, in a different manner.

It would be difficult to do justice to the view, which Mr. Hey has given of the subject, by any analysis of the volume before us, which we recommend to every practitioner to study, who may be liable to be called upon to treat this disease. For the disease is too rapid to admit of delay and hesitation, and must be attacked with as much promptitude as vigour, in order to be combated with success; and therefore the practitioner cannot have premeditated too much on the treatment which he will adopt.

The author begins by proving, in his preface, by quotations from the most distinguished authors on the subject, the extraordinary contrariety of opinion which has always prevailed respecting the disease in question, except with respect to its danger and fatality, which is generally admitted. When the

epidemic at Leeds appeared, Mr. Hey had not seen the excellent treatise of Dr. Gordon, of Aberdeen, who adopted a different and much more successful practice than had previously been used. The sequel of the volume exhibits the early fatality of the disease under Mr. Hey's management, his gradual and judicious alteration of measures, and his ultimate arrival at the same successful treatment which Dr. Gordon had recommended; under which he cured a long series of cases, some of them of the most alarming kind, without losing a single patient. This detail is extremely interesting, and displays in a high degree the candour, zeal, humanity, industry, and intelligence of the author, to whom, it is obvious, many of the females of Leeds and its vicinity are indebted for their lives and safety under that formidable epidemic.

In the first introductory chapter, Mr. Hey states the pathognomonic symptoms of the disease, to be "fever in child-bed, accompanied with pain which has no complete intermission, and extreme soreness, in the abdomen;" and then adverts to the different views which the most popular writers have entertained of the nature of the puerperal fever. While a few have considered the disease as purely inflammatory, others have supposed it to be a modification of typhus or jail-fever; and others again have adopted a middle course, and believed it to be inflammatory in its commencement, but to have a strong and rapid tendency to putrescence in its progress. Dr. Clarke, and most other writers, have generally deemed the epidemic form of the disease to be of the typhoid kind, and on that account more fatal. Dr. Clarke especially distinguishes the "low fever of child-bed, connected with affection of the abdomen, which is sometimes epidemic," from the inflammatory diseases of the uterus, ovaria, and peritonæum; and Dr. Thomas, who professes to give a summary of the opinions of the most celebrated writers of the present day, in his "*Modern Practice of Physic*," states, that the puerperal fever "has generally a strong tendency to the typhoid type," and requires an essentially different treatment from inflammation of the uterus, peritonæum, or omentum. This, indeed, is the general

opinion, we believe, of the profession, resulting from the precepts of those who take the lead in directing public opinion on these subjects. These precepts had no inconsiderable influence on the first attempts of Mr. Hey to cure the epidemic which appeared at Leeds. From a diligent consideration of the circumstances, there was no room for doubt that it was most similar to the "low fever" of Dr. Clarke, and to that of "a typhoid type" described by others. At first every case seen by Mr. Hey terminated fatally, with great rapidity. He found by experience, however, that purging gave great relief, though still fearful of carrying it to a great extent, and he did not venture upon the use of the lancet, in a disease "attended by such sudden and early sinking, and in which both these remedies had been so strongly condemned." The complete success, however, which attended the change of practice which he ultimately adopted, led him to the conclusion, that there is no essential difference in the epidemic and sporadic disease, except in the greater violence and severity of the former, and the more active employment of the same remedies by which both are cured.

In Chapter II. the author gives a sketch of the progress of the epidemic at Leeds, and a very perspicuous history of the symptoms, as they fell under his observation. The disease commenced in November 1809, and continued, with some considerable intermissions, till Christmas 1812, after which the author was prevented from seeing any more of it by a long illness in his own person. It attacked all ranks of women indiscriminately, not only in Leeds, but in the country around it, and in towns at some distance, and "many fell victims to the disorder, whose situation, circumstances, and precautions might have been expected to exempt them from it, if any care could have availed them to that end." Yet no connection could be traced between this epidemic and any perceptible variations of the atmosphere; for "it prevailed equally in cold and hot weather, in wet and dry seasons, in winter and summer." There was no other disease particularly prevalent at the same time, except erysipelatous inflammations, which also, according to Dr. Gordon, accompanied the progress of the puerpe-

ral fever at Aberdeen. The occurrence of this fever was not at all connected with any particular species of labour; nay it most frequently occurred after the most easy and natural labours.

We need not enter into the detail of symptoms, which are copiously and distinctly described; but we shall quote the following passage, as throwing some light on the nature of the disease, and as comprising observations that are confirmed by all the cases hereafter recorded.

“A degree of fulness in the hypogastric region was often evident from the first attack, and not unfrequently *the uterus* could easily be perceived, forming a distinct tumour above the pubes. *Pressure upon it gave exquisite pain.* In about six or eight hours, if the patient was not relieved, the swelling began to extend itself to the whole abdomen, which was soon distended to a great size, and the enlargement of the uterus was lost in the general tumefaction. A diminution in the size of that viscus was a very favourable symptom. The soreness and swelling of the abdomen occasioned great shortness of breathing, and obliged the patient to lie constantly on her back. There was always some mitigation of the disease when the breathing became slower, or the patient was able to change her position, and lie upon her side.”

That this is a description of abdominal inflammation, beginning probably in the uterus, and extending to all the duplicatures of the peritonæum, who can doubt? The symptoms recorded in the next paragraph have, indeed, misled the best observers into a notion of *typhus*; but by the test of, we may almost say, unvarying success, Mr. Hey proved that these *typhoid* symptoms are anticipated by the lancet and copious purgation.

“If the disorder was not checked, great depression of strength and other appearances of sinking quickly supervened. The pulse was too rapid to be counted; the tongue sometimes, though not usually, became dry and brown, and the teeth were covered with sordes; the cheeks were flushed; the countenance was wild and expressive of great distress; and the whole body was covered with a clammy sweat. At this period

the violent pain of the abdomen often ceased; but its distention occasioned pains in the back, sides, and chest, sometimes accompanied with spasmodic paroxysms of dyspnœa. The patient became restless, and affected with vomiting, hiccough, delirium, and other symptoms which are the usual harbingers of dissolution, though not peculiar to this fever; and the melancholy scene was usually closed in a few days from the commencement of the attack." p. 24-5.

After a series of valuable practical observations on the variations in the periods of attack and termination, and of different symptoms, particularly of the rigor, pain, state of tongue, affection of the head, and condition of the blood when drawn, the author proceeds, in the third and longest chapter, to the detail of cases, which are interspersed with many practical remarks, and followed by a general view of the method of cure. The progress of his opinion in the treatment of the malady is traced in a very interesting manner. After the relation of two fatal cases, in which, as well as in all that had been mentioned to the author and his father in the practice of others, the want of success had led them to meditate beforehand upon the treatment to be adopted in the next case that should occur, the author states the views which they took of the subject. Great temporary relief had been produced by purgatives in the two preceding cases; the stools were slimy and dysenteric; and there was obviously abdominal inflammation, "which seemed, however, of a kind not likely to bear blood-letting." They determined, therefore, to adhere more closely to Dr. Denman's plan, of purging freely in the day, and procuring repose at night by an opiate; and also to evacuate the bowels early in every case by a gentle laxative, as the means of prevention. The "undesired opportunity" of putting this suggestion to the test soon occurred.

A lady was attacked with shivering, pain, and heat, about forty-eight hours after an easy delivery. The progress of the disease is fully detailed, reports being given daily, and great relief was obviously obtained from free purgation with manna and sulphate of magnesia, with intermediate anodynes, and fomentations of the abdomen. The operation of the purgatives

was followed again and again by diminution of the fever, and even of the abdominal tenderness on pressure, and two quiet nights were produced; but on the third day, the symptoms again recurred, and continued to increase, with vomiting; and on the fourth, the pain and soreness were nearly gone, and other symptoms of commencing gangrene indicated the approach of the fatal termination, which took place on the following day. The fourth case we shall quote on account of its brevity.

“The circumstance most worthy of remark in the fourth case, was the early and sudden transition from symptoms of active inflammation to those of debility and sinking. The patient was a robust woman, who was lying in of her first child. She was delivered on Sunday afternoon at four o’clock, and on the following day, she was directed to take, at intervals, a solution of sulphate of magnesia, as a means of prevention.

“At two o’clock on Tuesday morning she was attacked with the disease, and I was called to visit her about five. The pain was more severe than in any of the former cases; and was accompanied with a full strong pulse. The sulphate of magnesia had not operated. I prescribed a purging draught with sulphate of soda and manna $\bar{a}\bar{a}$ $\frac{z}{ss}$. in two ounces of infusion of senna. I also directed a cathartic injection to assist its operation. A consultation with a physician took place in the forenoon, when eight or ten leeches, and afterwards a blister, were ordered to be applied to the abdomen.

“At three *p. m.* the pulse had evidently begun to lose its strength, and other symptoms of debility had become manifest. A distention of the abdomen, which had previously taken place, advanced with rapidity; an obstinate vomiting supervened; and the disease finished its career in thirty-five hours from its first seizure.

“It will not be thought surprising, by those at least who consider the puerperal fever as a modification of typhus, or as having a strong and rapid tendency to it, that the result of this case tended to confirm our fears of having recourse to the lancet.” p. 51.

The 5th case was still more rapidly fatal; for the disease

commenced twenty-six hours after delivery, and notwithstanding the patient was attended four times that day, and consultations held, she died forty-three hours after that event, and about seventeen from the commencement of the disease. The sixth case ended fatally in about forty-eight hours; and in this, some camphor mixture and bark were prescribed in consultation. In the seventh there appeared to be great predisposition to the disease during the latter part of pregnancy. Purging materially alleviated the symptoms at first, but an erysipelatous inflammation attacked the nates and pudendum on the third day, and on the sixth the patient died. In the eighth case the disease came on so late as six days after delivery, and copious purging was the remedy resorted to, together with anodyne clysters to soothe the irritation which it might occasion; and this patient with some difficulty recovered. It was remarkable, that "though the bowels were freely evacuated on the day after delivery, and never afterwards became constipated; and though, after the attack of the disease, purgatives and clysters were given every day, yet a remarkable quantity of hardened feces was repeatedly discharged."—"On a view of the last case," the author adds, "I am persuaded that, had we not been too fearful of exhausting the strength of the patient, but had purged her more briskly at first, the disease would much sooner have been brought to a close." p. 77. Soon afterwards two other cases were successfully treated chiefly by purging; but after this time four were attacked by the disease fatally.

Of the fourteen cases then here mentioned, which occurred in the author's practice between December 1809 and June 1810, *eleven* terminated in death, and *three* in recovery. The last case which he saw had exhibited considerable appearances of inflammation; purging had been the only remedy from which he observed any relief; and having seen an abstract of Dr. Gordon's practice in Thomas's Modern Practice of Physic, in which bleeding and purging were the remedies depended upon, Mr. Hey now felt strongly inclined to try the use of the lancet, notwithstanding the general impression respecting the low and typhoid type of the disease. A stout wo-

man was attacked with symptoms of puerperal fever (Case ix.) on the third day after labour, which had been accompanied by considerable hæmorrhage. After using a purging medicine and clyster, he took away seven ounces of blood, at 5 p. m. and applied a blister; at 8 p. m. the blood was found highly firm and buffy, and seven ounces more were taken, which proved more firm and buffy than the former; at 10, great relief to all the symptoms had been produced. This relief continued all next day, copious alvine evacuations being also produced, and till the evening of the following day, when a violent affection of the head came on, with strong quick pulse, which was relieved by leeches to the temples, and by the abstraction of three ounces of blood from the temporal artery. On the following day she continued better on the side of the head which had been bled, and three ounces were taken from the other, and an ounce and half more in the evening, in consequence of a relapse. On the next day some symptoms of paralysis showed themselves, and in consultation some wine and an ætherial medicine were ordered. There was no farther abdominal affection; but the patient became delirious, and died on the 13th day in a state of great distress and restlessness. This case was in fact a remarkable instance of metastasis; but the entire removal of the abdominal affection, and the appearance of the blood, confirmed the author in his notion of the propriety of blood-letting. In the 10th case, which occurred soon after, he took away 20 ounces of blood, seven or eight hours after the disease commenced, and found the pain diminished while the blood was flowing, and the next morning nearly gone; purging was continued two days, and the patient recovered without further complaint.

From this time the author adopted Dr. Gordon's method, (whose treatise he had now obtained,) and which coincided with, and confirmed his own recent views; and after this period he attended a great number of patients, attacked with equal or more violence than those whom he had already treated, of whom, however, but three died, namely, in the following order, the 11th, 13th, and 15th cases; but after this period, by a still more vigorous pursuit of the same plan, he

had the satisfaction of seeing *all his patients recover*. In the three fatal cases, indeed, the circumstances were such as to afford no disparagement to the principle of the treatment employed: in the 13th case, venesection was not permitted; and in the 15th, the disease was so much subdued, that the patient went on to the end of six weeks, and perished rather from the sequelæ, than from the actual disease. We quote the following case (the 21st) as a specimen of the author's active and successful management of this previously fatal disease.

"August 3d, 1812, at one o'clock in the morning, the wife of T. W. of Hunslet, a woman of rather delicate appearance, was delivered by a midwife of her 12th child, after an easy labour of about an hour. Her discharge both at the time of labour and afterwards was said to be severe, but not excessive. On the following morning she had a shivering fit, which was not, however, succeeded by pain; and she remained well throughout the day. The after-pains were slight.

"5th.—At four o'clock in the morning, she was suddenly seized, without any previous chilliness, with a violent pain in the body, resembling labour-pain, but of much longer duration. It increased progressively during the day; and in the intervals, which were not longer than a quarter of an hour; the abdomen was sore.

"I first saw her between four and five in the afternoon, and found her crying out in pain like a woman in labour, &c."—"The patient had taken some opening medicine, which had produced one loose evacuation in the morning. The symptoms, in this case, were not the most alarming, considering that thirteen hours had elapsed since the commencement of the disease; but the pain was violent, and the loss of time was more than a counterbalance to the apparent mildness of the other symptoms. I was therefore satisfied that large bleeding in the first instance was necessary; especially as night was approaching, and the patient lived at some distance from me. I first took away twenty-five ounces of blood, without producing any degree of faintness; when I closed the orifice for a few moments, till another basin was procured; and then drew nine ounces more. She was now disposed to faint, and the pain was

much diminished. I put my finger on the orifice, and waited a while. The faintness soon went off, and the pain returned; I therefore took away six ounces more, making in the whole forty ounces. The patient becoming again very faint, I tied up the arm: she soon recovered, and remained easy. Pulse 88." (It was "112 and hard" before the bleeding.) "A clyster was injected as soon as it could be prepared, which in ten minutes produced a very copious evacuation of solid fæces. At six p.m. I gave a bolus with half a dram of jalap and four grains of calomel; and left directions that three table spoonfuls of the cathartic solution" (water eight ounces, sulphate of magnes. one ounce) "should be taken every two hours, till the bowels should be well opened, beginning two hours after the bolus.

"*Half-past ten, p. m.* The pain had returned soon after I left her, and with as much severity as before the bleeding. She had had three small watery stools, which did not appear to be the effect of the purgatives. The heat of the skin was now considerable, and was attended with much restlessness. The pulse was at 120, and still hard. The tongue was rather white, and the abdomen was much more tender; particularly in the region of the uterus, which had become enlarged, and easily distinguishable. The increase of all the symptoms since my former visit seemed not only to justify the quantity of blood then taken, but to require a further evacuation. I tied up the arm, and took eight ounces from the same orifice, when, the patient proving faint, I desisted. The pain was much alleviated by this second bleeding, and the pulse came down to 84. I ordered the solution to be taken every hour.

"6th. *Eight a. m.*—She had remained nearly free from pain all the night; the soreness had greatly abated, the uterus was diminished in size, and she had slept several hours. The skin was moist, and of a natural heat; the pulse at 100. She had taken above two ounces of magnes. sulphas, besides the purging bolus; and had had many small evacuations, which, however, contained but little fæces. Two boluses were therefore prescribed, with fifteen grains of jalap and two of calomel in each, to be taken with an interval of two hours; and the solution was ordered to be afterwards continued.

"*Six p. m.*—Both the boluses had been taken, and the remainder of the third ounce of magnes. sulphas, which had procured a great number of natural stools. The patient continued free from pain; the soreness of the abdomen was quite gone, and the uterus was scarcely to be felt.

"7th.—She had slept the greatest part of the night, and the pulse was at 84. The bowels were kept open, and she continued convalescent."—p. 131.

We cannot help remarking, on the perusal of this and most of the cases here related, how very easy it would be for any treatment of this sort to lose its credit; and how very unlikely that it should ever gain credit, against the prejudices of education, in ordinary hands; because its failure to cure, when timidly used, or when resorted to late, or by men who did not thus assiduously repeat their visits at intervals of a few hours, in proportion to the danger of their patients, would probably be construed into actual injury. And it has been thus perhaps from the inefficient influence of a small bleeding, begun too late, or repeated after too long an interval, that the natural tendency of the disease to rapid lowness may have been supposed to be the result of, or at least to have been aggravated by the ill-managed remedy. The necessity of proportioning blood-letting, in all cases, to the actual effect which it is observed to produce upon the patient and the disease, and not by any arbitrary measure of ounces, if we would do justice to the patient, and obtain the full agency of the remedy, must be very obvious; and it is perhaps to this assiduous and judicious use of the means, that the great success of Mr. Hey is to be chiefly imputed.

In the conclusion of this chapter there are many excellent practical observations, which the length to which we have already extended our remarks will not permit us to recapitulate. Bleeding and purging, when employed in a proper and seasonable manner, were obviously adequate to the cure of the disease, and other remedies were merely auxiliary. Dr. Gordon affirmed, that one bleeding of 24 ounces, if performed within six or eight hours of the attack, together with a single purgation, never failed to cure the disease; that if called within 12 hours he promised success from bleeding; but if the

period were later, as from 12 to 24 hours after the attack, he could not promise success, though he deemed it the only effectual remedy. Mr. Hey justly maintains that no such precise limit can be laid down in all cases; for while one of his cases terminated fatally in less than 18 hours, in some others bleeding was successful, when a delay of more than 24 hours had occurred. Nor does he admit any similar limitation of the quantity of blood to be drawn: he thinks, indeed, that there is scarcely any other limit than the removal or considerable diminution of the pain, "provided all that is requisite be drawn within twelve hours of the first evacuation."

"If the disease is clearly ascertained, no other consideration is of much importance. The state of the pulse affords little information either as to the propriety of bleeding, or the quantity of blood proper to be taken away; and if we are deterred, either by the apparent weakness of the patient, by the frequency and feebleness of the pulse, or by any other symptom, from bleeding copiously, we shall generally fail to cure the disease." p. 161.

Immediately after bleeding the most speedy and most effectual means of purgation were resorted to, and continued, so as to produce an evacuation once in three or four hours, which was maintained for two or three days, or longer if necessary. This accords with Dr. Gordon's precept, that "the purging is to be early excited, and to be continued without intermission, till there be a complete termination of the disease." Mr. Hey always found *opiates* destitute of any advantage, affording but an insidious truce, and rather tending to prolong the disease. Circumstances may render purgative or emollient injections useful; fomentations, if properly applied, are soothing, and never did harm; but blisters are inconvenient, and seldom necessary.

If these means fail to cure the disease, from being employed too late or in an improper manner, the mischief produced in the cavity of the abdomen, whether by extravasation, suppuration, or gangrene, is beyond the reach of medicine; and nothing can be done, save to alleviate distressing feelings; cordials and tonics can afford no other advantage. Purgings, however, is proper in every stage of the disease, unless gangrene has

actually taken place; and should be excited, if possible, when bleeding has become inadmissible.

The success of this practice, then, was as follows. Before the plan of bleeding was adopted, of fourteen patients only three recovered; but after the 15th case, which occurred in the author's practice, of thirty-three patients only three died; and the last twenty-six recovered in uninterrupted succession. Yet this was an *epidemic* puerperal fever, which has been said by most of the writers to be of a low or typhoid character. This is at least the third example of an epidemic fever of this sort, which was combated effectually by copious and active evacuations only; for those of Aberdeen and Sunderland, described by Drs. Gordon and Armstrong, were of the same species. When we consider what a general bugbear typhus, (i. e. debility, putrescency, &c.) was, at the time when most of the books on this subject were written; how distinctly in some cases the general opinion has veered round in that respect of late; how very much like low fever are many of the abdominal inflammations after the acute stage is past, where they have been neglected or maltreated; and how injurious we find the use of cordials, bark, and other excitants in the common fevers of this country at present; we are disposed to agree with the author before us, that the puerperal fever is always essentially the same disease, "inflammatory at its beginning, and putrid only in its progress;" and that the distinction between the *sporadic* and *epidemic* disease is so far only important in practice, "that the epidemic disease requires more prompt attention, and more vigorous treatment;" for that "the means of cure are precisely the same in both; but in the latter their measure is greater and less limited, and the period within which they must be employed is far more circumscribed." p. 182.

Whatever may be the general inference upon this subject, this little treatise will be deemed a perspicuous and judicious history of a severe and dangerous epidemic, characterized by sound pathological knowledge, clear arrangement, and great correctness of composition, and worthy to be classed with the best monographs of modern medical literature.

ORIGINAL PAPERS.

 FOR THE ECLECTIC REPERTORY.
On Re-infection in the Ship Fever of Tropical Climates.

BY SAMUEL POWEL GRIFFITTS, M. D.

DR. W. PYM, inspector of British hospitals, published, in the Edinburgh Medical and Surgical Journal for April 1816, a paper entitled "Proofs of the Bulam Fever attacking the Human Frame only once." This publication forcibly attracted my attention. The doctor asserts, that the disease called yellow fever in our country, but which he has specifically named Bulam fever, never attacks the same person twice. Dr. Fellowes, in his account of the pestilential fever of Andalusia, fully confirms this fact. It is well to compare the opinions entertained by medical men in different parts of the world, and more especially the facts related by them. Concerning the fever in question I have no desire to revive controversy. After a long and painful acquaintance with it, I am well convinced that its proper character is, the *ship, or jail, or hospital fever of tropical climates*; that it is, of course, a disease *sui generis*, distinct from the endemic or indigenous yellow fever of the West Indies, and from the bilious remittent fever of hot climates. I have seen it, and carefully attended to its nature and progress, in Philadelphia, in the years 1793, 1797, 1798, 1799, 1802, 1803, and 1805; having, during all this time, been absent from the city only two weeks in 1793, after a severe attack of the disorder. My attention was arrested in 1798 by observing that persons who had had the disease before, were then exempted from it, although few others escaped. I mentioned the fact, and was much ridiculed for my remark. This could not hinder my continued attention to the subject; and

my opinion being confirmed by succeeding observations, I can now safely assert, that during the seven years of its appearance amongst us, I did not meet with one instance of the same person's being infected with this disease the second time. I observed the fever pass through large families, attacking those only who had not been before infected. These facts were too powerful not to have their proper weight.

I acknowledge my having attended persons in this fever, who said they had had it before. This I do not mean to controvert; I only give my own experience, as to never having myself seen it twice in the same person. I know that several of my medical friends, who regard the Bulam fever or ship fever of tropical climates, as a different grade of the bilious remittent, differ widely from me as to facts and theory—and with their ideas of the fever in question, it cannot well be otherwise. I merely wish to give the result of my own observations; believing that a fair and correct account of interesting facts, as they occur, should be collected and spread before the medical world. And perhaps such collections will be more valuable by being unaccompanied with theoretical remarks. They will serve to give us more correct ideas of diseases; and as to the present one, may assist in solving the question, so much agitated, whether it be contagious or not—or in other words, communicable from one person to another: a most important question; on the right decision of which, the comfort and safety of those exposed to it in a great degree depend.

As an additional fact in favour of this fever not attacking the same person a second time, it will be well to remark, that none of the physicians of Philadelphia, who were infected with it in 1793, have since died of this disease—and it may not be foreign to observe, that those who have once suffered from attacks of bilious remittent or intermittent fevers, are much more liable than others to be again affected by them when exposed to the same causes; another striking discrimination between the remittent bilious fever, and the Bulam or ship fever of tropical climates.

Philadelphia, 8th mo. 13, 1816.

FOR THE ECLECTIC REPERTORY.

Case of Hernia.

BY JOSEPH P. NANCREDE, M.D.

ANDREW PATEN, a coloured man, about 30 years of age, strongly built, and of a large stature, having always enjoyed good health, had been subject to a scrotal hernia on the right side for the last five years, but which being well maintained in its situation by a truss, had never occasioned the least inconvenience. On Friday, August 10, while raising his carriage, (he being a coachman), he made an effort, which was succeeded by a sudden pain in the left groin, but which appears, however, not to have been sufficiently acute to excite alarm, or even to induce him to examine the spot, which was the seat of the pain. This occurred at about three in the afternoon, and in the evening, as usual, he returned home, complaining merely of fatigue, and went to bed without any examination, although the pain had not abated. At about eleven, however, he was roused by the increase of his sufferings, which were now so violent as to make him cry out; vomiting and hiccup made their appearance simultaneously, and the pain, extending throughout the abdomen, but more particularly below the navel, became excruciating. His sufferings had alarmed him and medical assistance was requested at about half past one. Upon examining and questioning the patient as to the probable cause of his colic, (for thus it appeared to me at first sight) no satisfactory information could be obtained. After some further investigation, however, he recollected having felt in the afternoon a small *lump* upon the left groin, and added, that his most violent pain had been at that spot. This tumour, about the size of a goose egg, proved upon examination to be a scrotal hernia of the left side, strangulated. Attempts had already been made by the patient to effect the reduction of the tumour, and I repeated them my-

self, in vain. But finding the tumour very hard, as well as the pulse, I went home in search of my lancets, having previously administered a dose of *ol. ricini*. On my return, however, after keeping the muscles relaxed for some time, the hernia was almost immediately reduced. The patient soon felt relieved, the pain had disappeared, and not the least vestige of the tumour remained, when I left him dosing.

A couple of hours afterwards the symptoms of strangulation were renewed, and continued the same as previous to the reduction of the hernia. No evacuation having taken place, a second dose of *ol. ricini* was ordered, but almost immediately vomited. A third cathartic, which he kept down, produced no effect whatever. It was then deemed necessary to take ten ounces of blood from the arm, which however failed to procure any relief. At twelve in the forenoon no abatement of the pain could be perceived, although the pulse was softer, but the vomitings and hiccups had disappeared: no passage had yet been procured, a dose of calomel and jalap was therefore prescribed. Having seen him a third time in the afternoon, and no amelioration being visible, the abdomen becoming painful to the touch, and tumefied, and still no evacuation, a second dose of calomel, with emollient injections were recommended, and the patient was bled a second time. The same situation manifested itself in the evening, when the patient was again bled for the third time. Although the reduction of the pulse was considerable, yet it procured no relief. The vomitings had occurred twice in the afternoon. Fomentations on the abdomen were ordered with the injections, but with the exception of a little relaxation in the tension of the abdomen, no effect was produced. An infusion of senna was administered also in vain.

I visited him early on the morning of Sunday the 12th, and found that his sufferings had not increased, although he had experienced no relief. He had not slept any during the night. The abdomen continued painful and tumefied, but he complained much more of pain in the groin on the right side than at any other point; no passage; the injections, fomentations,

and the infusion of senna, were directed to be continued. The pulse had become tense and tremulous.

The case proving obstinate, I requested the advice of my friend and neighbour, Dr. Povall, who called to see the patient with me, and agreed in opinion that the symptoms of strangulation most probably arose from a stricture of the hernial sac, that had been reduced with the intestine. It was determined at his suggestion to apply a large blister on the abdomen, and to insist upon the injections of large quantities of warm water, with the hope of overcoming the obstruction which existed. The blister did not produce on the skin or system any effect whatever, and the other remedies made use of were equally ineffectual. A copious bleeding was ordered in the afternoon, owing to the hardness of the pulse. The night from Sunday to Monday was equally restless. On Monday, his situation continuing the same, it was agreed between Dr. P. and myself that a dose of gum gamb. and calomel should be given, and cold water poured on the lower extremities. No effect whatever from either. His sufferings as great as the day previous. The vomiting and some hiccup had occurred, but gave way to the camphorated mixture which was now recommended.

On Tuesday morning his pulse was considerably depressed, the tension of the abdomen had subsided, and it was much less painful, but the extremities were cold, accompanied by clammy sweats. The voice had undergone some alteration, constant anxiety and restlessness were also observed. The injections were continued during the day, and a decoction of tobacco was also added. Notwithstanding the treatment the inflammation maintained its ground. No passage could be procured. Several medical gentlemen saw the patient in the course of this day, and agreed with me in the opinion that very little hope could be entertained. At the suggestion of one of the gentlemen, quicksilver was administered in the proportion of an ounce, but also in vain: it was repeated equally in vain. Dr. Parrish was called to see the patient in consultation on Wednesday, and concurred in opinion with

Dr. Povall and myself as to the probable cause of those very dangerous symptoms.

The pulse continued to sink, and, with some remissions, when it would rise in an unaccountable manner, gradually lost both its strength and regularity. Vomitings, but more especially the hiccup, became very troublesome, and the least motion produced fresh pains. The camphorated solution was of service in relieving him from the hiccup. In this situation, when every remedy had failed, he kept lingering until the night of Thursday to Friday, when he expired—the seventh day of his disease.

I proceeded the next morning to the opening of the body, accompanied by Dr. Povall.

On opening the abdomen we found the whole mass of the intestinal tube, commencing at the strictured part and extending upwards, distended with air: the vessels of the omentum, as well as those of the mesentery, very much injected with blood, and the greatest portion of the intestines bearing evident marks of inflammation. The seat of the disease, however, was confined to the jejunum, which for the length of twelve inches had lost its colour and was in a complete state of sphacelus. A portion of this intestine was confined in the inner portion of the abdominal ring, where the hernial sac formed a stricture round it, which having also participated in the general mortification, was totally disorganized, and could easily be torn away by the nail. So complete had been this adhesion, that when it was ruptured by a very slight effort, a hole in the intestinal canal, about the size of a shilling, was produced. We also noticed another hole near it, of the same size, having all the appearance of an ulcer. Having cut open the intestine at its most diseased point, for a few inches, pus, and a remarkable black appearance on the internal coat, were observed. Several black spots here and there were also noticed in this vicinity. A remarkable spot about the size of a half dollar, attracted our attention. It was situated about the middle of the transverse portion of the colon. It was very evident to us that the intestines contained in the right side of the abdomen, but more particularly in its lower region, had been the

seat of a more extensive and acute inflammation than those situated on the left. The inguinal ring, which was diseased, as we have already noticed, on the left side, had protruded in the abdomen as much as an inch, by the increase of its volume.

Philadelphia, August, 1810.

OBITUARY NOTICE.

[From the Edinburgh Medical and Surgical Journal, for July, 1816.]

DIED, on Tuesday the 18th instant, (June) in the 82d year of his age, Mr. THOMAS HENRY, President of the Literary and Philosophical Society of Manchester, Fellow of the Royal Society in London, and Member of several other learned Societies both in this country and abroad. As a practical and philosophical chemist, he had obtained a high and merited reputation. His contributions to that science, besides a small volume of Essays and his Translations of the earlier writings of Lavoisier, which he first introduced to the notice of the English reader, consist chiefly of Memoirs, dispersed through the Transactions of the various Societies to which he belonged, and relating both to those parts of chemistry that are purely scientific, and to those which have a connection with the useful arts. On a subject intimately connected with the success of the cotton manufacture, (the employment of Mordants or Bases in dyeing,) "Mr. Henry was the first," to use the words applied to him by a subsequent author, "who thought and wrote philosophically." In the introduction, too, of the new mode of bleaching, which has worked an entire revolution in that art, and occasioned an incomparably quicker circulation of capital, he was one of the earliest and most successful agents. In addition to the acquirements connected with his profession, he had cultivated, to no inconsiderable degree, a taste for the productions of the Fine Arts: he had

obtained a knowledge of historical events remarkable for its extent and accuracy; and he had derived, from reading and reflection, opinions to which he was steadily attached, on those topics of political, moral, and religious inquiry, which are most important to the welfare of mankind. For several years past, he had retired from the practice of medicine, in which he had extensively engaged, with credit and success, for more than half a century; and, from delicate health, he had long ceased to take an active share in the practical cultivation of science. But possessing, almost unimpaired, his faculties of memory and judgment, he continued to feel a lively interest in the advancement of literature and philosophy. Retaining, also, in their full vigour, those kind affections of the heart, that gave birth to the most estimable moral qualities, and secured the faithful attachment of his friends, he passed through a long and serene old age, experiencing little but its comforts and its honours, and habitually thankful for the blessings with which Providence had indulged him.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

On the Bad Effects of the Incautious Use of Magnesia. By
EVERARD BRANDE, Esq.

[From the Journal of Science and the Arts, No. II, for 1816.]

AT a time when domestic empiricism is so prevalent as at present, it is important to point out the dangers which may arise from the uses, or rather the abuses of the most simple remedies.

Every medical practitioner must have repeatedly witnessed the serious, and sometimes the fatal consequences attendant upon the imprudent use of the stronger medicines, which are so extensively supplied for family consumption, particularly preparations of antimony, mercury, and opium, which, under a great variety of seducing forms and titles, are constantly employed; generally, however, they are, I believe, not sufficiently aware of the prejudicial effects of the too liberal use of magnesia; either those which may arise from its chemical action upon the urine, which are more immediately observable and common, or which may arise from its mechanical action, as an extraneous insoluble substance, and which are more remote, obscure, and rare.

I need not dilate upon the former, but may refer to my brother's observations upon that subject, published in the Philosophical Transactions for the year 1810, which, I regret, are too little attended to; and with respect to the latter, shall confine myself to the recital of the following case.

A lady was recommended to take magnesia, in consequence of some very severe nephritic attacks, accompanied with the passage of gravel. She was desired to take a tea-spoonful every night; and Henry's calcined magnesia was preferred, as that always operated upon the bowels and "carried itself off,"

which other magnesia did not, but, on the contrary, felt heavy and uneasy in the stomach. The dose was gradually increased to two tea-spoonfuls, in order to produce effect upon the bowels, which this quantity never failed to do; the symptoms for which it was ordered were soon removed, but the plan was persevered in for two years and a half, with little intermission or irregularity; so that as the average weight of a tea-spoonful is at least forty grains, and the average dose was a tea-spoonful and a half, it may be presumed that she took during the above period between nine and ten pounds troy.

In the course of the last autumn she suffered severely by a miscarriage, and shortly afterwards by an attack of biliary calculi; subsequent to which she became sensible of a tenderness in the left side just above the groin, connected with a deep-seated tumour, obscurely to be felt upon pressure, and subject to attacks of constipation, with painful spasmodic action of the bowels, tenesmus, and a highly irritable state of stomach; these attacks recurred every two or three weeks, varying in violence, but requiring the use of active remedies; during one of them, about the middle of last March, a large quantity of sand was voided by the rectum, attended with a peculiar acute and distressing pain in the seat of the tumour above mentioned. This was lost. The following day, however, the same kind of evacuation happened again, and to the same extent, which being saved and measured, was found to amount to two pints. Another attack took place upon the 5th of April, when several irregular lumps of a soft light brown substance were voided, having the appearance of a large mass broken down, and when dry extremely friable: a part of each of these two last were subjected to a careful analysis, and found to consist entirely of sub-carbonate of magnesia concreted by the mucus of the bowels, in the proportion of about 40 per cent.

The use of magnesia was now given up, and that of an active purgative medicine enjoined, with some other necessary directions, and there is every appearance of returning health, although some slight attacks have recurred, and small portions of the same concretion still occasionally come away.

An instance, in many respects resembling this, has lately occurred in the practice of some gentlemen of eminence in this town, in which not only large quantities of a concretion of a similar description were voided, but upon examination after death, which took place perhaps six months after any magnesia had been taken, a collection, supposed to be from four to six pounds, was found embedded in the head of the colon, which was of course much distended. Some notes which were made of this case are, I fear, not to be found.

The Marquis of RIDOLFI's Method of separating Platina from the other metallic substances which are found with it in the state of Ore; from the "Giornale di Scienze ed Arti," published at Florence.

[From the Journal of Science and the Arts, No. II, for 1816.]

THE Marquis Ridolfi, after giving a detail of various experiments which he has made upon platina, proceeds thus: "No one has been able to combine sulphur with platina, so as to form a sulphuret of that metal. From this peculiarity of platina, the idea struck me, that if one could convert the other metallic substances found in platina into sulphurets, it would be easy to purify that metal. With this view, I took an ounce of crude platina, and separated from it some of the extraneous substances usually mixed with it. I washed it with nitro-muriatic acid, diluted with four times its weight of water. I then washed it in hot water, with a view of removing portions of iron and of gold which might be in the powder; but I afterwards found these washings useless. I then melted the mass with half its weight of pure lead, and threw it into cold water, and thus obtained an alloy which was pulverised and mixed with an equal portion of sulphur. I threw the mixture into a white-hot Hessian crucible, which was instantly covered, and let it remain in an intense heat for ten minutes. I then suffered it to cool gradually. It contained much dross, and a brittle

metallic button composed of platina, lead, and sulphur. I then again fused it with a small addition of lead, and when it had cooled I found that the sulphur was in the dross, and that there only remained an alloy of platina and lead.

I then heated this alloy to whiteness, and beat it with a hot hammer on a hot anvil, which forced out the lead in fusion. Here I must observe that unless the alloy is white-hot the beating must be suspended, as it will break.

I thus obtained platina so pure as to make with it a capsule, a spoon, wire, and leaves which were nearly as thin as gold leaf. It was ductile, malleable, and as tenacious as that obtained from the ammoniacal muriate. Its specific gravity was 22,630.

This description is sufficient to show the purity of the platina. I repeated the process several times. I did not always find the platina in a lump at the bottom of the crucible; it was sometimes scattered in globules amongst the dross. In this case it is only necessary to heat the mass with a little diluted sulphuric acid, the globules are soon liberated from the dross, and sink to the bottom of the crucible. Collect and wash them, and submit them to the same operation of the hammer, as if the platina had been found united in one mass with the lead. I did not ascertain whether all the metals contained in the ore had become sulphurets, but they were all separated from the platina during the fusion and the formation of the sulphuret of lead.

Proceedings of the Royal Society of London.

[From the Journal of Science and the Arts, No. II, for 1816.]

FEB. 29. A paper was communicated by Mr. Ivory, containing an investigation of the theory of capillary attraction, a subject which, notwithstanding the numerous and important experiments that have been made upon it, still remains in much obscurity. Mr. Ivory advocates the Newtonian hypo-

thesis, and adduces several proofs of the correctness of Mr. Leslie's enquiries, published in the year 1802 in the *Philosophical Magazine*. The paper contained a series of mathematical investigations relating to the subject, which were not of a nature to be read before the Society.

The reading of a letter from Dr. Brewster to the President was commenced, and continued during two successive sittings, "on the communication of double refraction to glass and other substances, by mechanical compression."

March 14. A Paper by Charles Babbage, Esq. F. R. S. was received, containing further remarks on the calculus of functions; the details were not such as could be entered into at a public meeting of the Society; the paper, therefore, was merely announced.

March 21. Sir Everard Home communicated some experiments to ascertain the mode of action of specific medicines: they related principally to that singular and efficacious remedy, the eau medicinale d'Husson. A variety of facts and statements were adduced, to prove that these medicines produce their effects by entering the blood, and acting directly upon the affected parts. Thus, mercury requires to be received into the circulation, before it can act upon the syphilitic virus, or remove the primary symptoms of the disease; and the eau medicinale must enter the blood before it can remove the gout. Mercury, and the eau d'Husson, are regarded as the only two known specifics; and it is assumed, though we think that farther researches are required to give firmness to the conclusion, that the eau medicinale is a vinous infusion of the roots of *Colchicum autumnale*, or meadow saffron. In the course of his communication Sir Everard throws out some curious hints upon the *modus operandi* of other medicines. Some acting upon the secretions of the stomach, and thus indirectly modifying the constitution of the blood; while others produce their effects in consequence of direct mixtures with that fluid. This is sometimes the case where we should least expect it. An infusion of ipecacuanha thrown into a vein excites vomiting, and opium produces drowsiness; and colchicum sickens, and perhaps cures the gout. Is it legitimate

hence to infer, that all these medicines, when taken into the stomach, are inert till they are received into the blood, and distributed to the parts upon which they produce sensible effects?

A paper on the composition and combinations of phosphoric acid, by Thomas Thomson, M. D. was commenced, and concluded at a succeeding meeting. According to Lavoisier's original researches, one part by weight of phosphorus unites to one and a half of oxygen to constitute phosphoric acid, a result which has been verified by several succeeding chemists, and more especially by Sir Humphry Davy, who regards this acid as composed of 20 phosphorus + 30 oxygen. But, according to the present analyst, 100 phosphorus unites only to 123.46 oxygen to produce phosphoric acid. Rose found the quantity of oxygen yet smaller. Dr. Thomson verifies his conclusion by reference to the analysis of phosphate of lead, and by taking a mean of methods, ultimately considers phosphoric acid as consisting of 100 phosphoric + 123,37 oxygen. He then proceeds to examine the compounds which the phosphoric acid produces by combining with lime, the phosphates of lime, of which, he conceives, there exist no less than six varieties, each of definite constitution: they bear the following names, 1. Quadrosteo-phosphate; 2. Binosteo-phosphate; 3. Bige-phosphate; 4. Osteo-phosphate; 6. Ge-phosphate. The constituents of many other phosphates are detailed in this communication; but as it would be indecorous to criticise a paper not published, and as without criticism the details would be of little avail, it is unnecessary at present to pursue them. Dr. Thomson infers from his numerous experiments, that the atomic doctrines of Berzelius are not worthy the confidence which he once put in them.

Proceedings of the Royal Society of Edinburgh.

[From the Journal of Science and the Arts, No. II, for 1816.]

APRIL 1. Dr. Murray communicated some additional Remarks on the Construction and Use of a Lamp for illuminating Coal Mines. The lamp was exhibited: it is well calculated for giving a strong steady light, and from being supplied with air from a tube reaching to the floor, affords great security.

April 15. Dr. Murray communicated the first part of a Paper on the Analysis of Sea Water. The methods employed were suggested by the views formerly delivered in Dr. Murray's paper on the analysis of the mineral waters of Dumblane, and the conclusions were conformable to these views.

April 29. Mr. Hugh Murray read an essay "On the Ancient Geography of Central and Eastern Asia, with Illustrations, derived from recent Discoveries in the North of India." Mr. M. conceived that the ancients, particularly Ptolemy and Pliny, knew more respecting this quarter of the world than is generally supposed. The modern discovery respecting the course of the rivers of the Punjab, and their union into one, before falling into the Indus, is a mere restoration of Ptolemy's map of these rivers. The western tributaries, so erroneously delineated by the moderns till the Cabul mission, are represented by him with nearly equal precision. Mr. M. conceives that Ptolemy's statements, carefully analysed, form a pretty correct outline of central and eastern Asia. Thus the extensive tract of the Sacarum Regio, bounded on the south by India, from which it is separated by the Imaus (Hemal-leh), corresponds in all its features with Little Thibet. Scythia extra Imaum, bounded by India beyond the Ganges, from which it is separated by the Mons Emodus, will then be Great Thibet, extended indefinitely into Tartary. Serica, then, bounded on the south partly by India beyond the Ganges, and partly by Siam (Sinarum Regio), will, under some modifications, be China. The very character of the Seres, mild, timid,

unwarlike, jealous of foreigners, and carrying on trade only at fixed frontier stations, represents exactly and exclusively the modern Chinese. Mr. M. then endeavours to show, that the prevailing systems of d'Anville, Gosselin, &c. are founded on an undue contempt of ancient authorities, and upon some slight resemblances of name, which, compared with the grand and permanent features of nature, cannot be allowed much weight in such an investigation.

At the same meeting Dr. Brewster laid before the Society a Paper on a new optical and mineralogical Property of calcareous Spar. Having formerly shown (Phil. Trans. 1815, p. 270) that the colours exhibited by some specimens of calcareous spar were produced by a thin film or interrupting stratum which divided the polarised light into its complementary tints; Dr. Brewster examined several new specimens which possessed this property, in order to ascertain the axes of this film. In the course of this examination he discovered that a prism could be cut out of a rhomboid of this kind, which, when combined with another prism of common calcareous spar, exercised such an action upon the transmitted light, that the combined prisms possessed none of the properties described by Huygens and Newton, that is, *none of the four images vanished in any position of the second prism, but continued visible during the whole of its revolution*. The combined prisms however recovered their usual property when the opposite face of the first prism received the incident pencil. Hence it follows, that the pencils were depolarised by the interrupting film; and Dr. B. has shown that the film has all its axes constantly inclined 45° to those of the mass which contains it. As the particles of the film are not symmetrically combined with those of the mass, they are not joined by their poles, and consequently they do not come into optical contact, light being always reflected at the junction. Some specimens possess two and even three sets of films or veins, each set being parallel to the common sections of the three surfaces which contain the solid angle.

May 6. Dr. Brewster read a Paper "on the Communication of double Refraction to Glass, and other hard and soft sub-

stances that refract singly, by mechanical Compression and Dilatation." Having inferred from the optical properties of heated glass, that its doubly refracting structure was owing to a variation of density, Dr. B. endeavoured, by means of screws, to produce the same mechanical change upon glass, and he found that in every case the glass was converted into a doubly refracting crystal while the pressure was continued. He next took long plates of glass with polished edges, and found that by slightly bending them with the hand, the convex or dilated side had the same structure as one class of doubly refracting crystals, while the concave or compressed side had the same structure as the other class. Muriate of soda, fluor spar, diamond, obsidian, semi-opal, horn, tortoise shell, amber, gum copal, caoutchouc, rosin, phosphorus, the crystalline lens, and the sclerotic coat of fishes, and other substances that have not the property of double refraction, receive it by compression or dilatation; while no effect whatever is produced upon doubly refracting crystals by the most powerful pressure. Many curious results were obtained by inclosing the glass in fluid metal and observing the changes which it underwent from the contraction of the metal in cooling. Upon the preceding principles is founded a *chromatic dynamometer* for measuring the intensity of forces, and various instruments for indicating differences of humidity and temperature by the expansions or contractions which they produce.

The second part of this paper related to the communication of double refraction either transiently or permanently to animal jellies, by gradual induration, or by mechanical compression or expansion.

It follows from these principles that in all crystals of one class there is a difference of density related to the axis; that in those of the other class, the difference of density is related to a line at right angles to the axis; and that in those crystals which have the structure of both classes the difference of density is related to two rectangular axes.

May 20. The conclusion of Dr. Murray's Paper on the Analysis of Sea Water was read.—He gave also the result of an analysis of a salt which is formed in the large way from the

brine of sea water, which seems hitherto to have escaped observation. It is a sulphate of magnesia and soda which crystallizes in very regular rhombs, occasionally truncated on some of the edges and angles. It contains a much smaller quantity of water of crystallization than either sulphate of soda or sulphate of magnesia; is less disagreeable to the taste, and differs from both in all its other properties. It has not hitherto been applied to any useful purpose, but it may probably form a very excellent purgative salt.

A Barometer was exhibited to the Society with a communication from Mr. Kennedy, suggesting a mode of rendering this valuable instrument more portable, and less liable to damage by the concussion of the mercury against the upper part of the tube: this it is proposed to prevent by introducing a small bell-shaped bulb of glass, attached to a spiral spring and fastened to the top of the tube. This improvement appears to be calculated to prevent the accidents which so frequently occur in the use of this instrument.

Dr. Gordon communicated certain observations to the Society, tending to establish the pathological fact, that the appearance called the *buffy coat*, or *inflammatory crust*, is not confined to venous blood, but is also occasionally seen on arterial blood, in similar states of the system. Dr. G. had himself an opportunity of seeing this appearance on arterial blood in one instance; and three other instances, in which it had occurred, were mentioned to him by Dr. Gregory, Mr. Ashburner, and Mr. Wishart.

Dr. Gordon also stated to the Society, that by a series of observations on the muscles of the living human body, during surgical operations,—on the muscles of limbs immediately after amputation,—and on the muscles of several of the lower animals, in a variety of circumstances, he conceived he had established, that the muscular fibre, during its contraction, does not exhibit the slightest appearance of *rugæ*, but remains perfectly straight; and that it does not undergo any perceptible enlargement in its transverse diameter.

May 27. Mr. Mackenzie read a Criticism on the Tragedy of Bertram lately published by Mr. Maturin.

June 3. Mr. Alison read a Part of a Memoir on the Life and Writings of the late Lord Woodhouselee.

A Paper by Mr. Cadell was read, "on the Lines that divide each semi-diurnal Arc into Six equal Parts."

The intertropical parts of these lines for the climates of Greece and Italy constitute the hour lines on the antique sundials. Most of the writers on gnomonics have considered these lines as great circles; Clavius alone demonstrates that they are not great circles: and afterwards Montucla states, but without discussion, that they are curves of a peculiar nature. The celebrated and profound astronomer Delambre, having examined only the portions that occur on the Greek dials, controverts the opinion of Montucla.

The object of the Paper is to show that the curved surfaces, whose sections form these lines, are undulated, and of the nature of cones, the apex of one undulation being as much elevated above the equator as the apex of the next undulation is depressed below it.

To see the curvature of these lines it is sufficient to draw them on a globe; and the undulated cone is completed by conceiving the diameter of the sphere, which has described the first branch, to move progressively and continuously between the two parallels that touch the horizon, until the extremities of the diameter arrive at the points from which they set out.

If it be proposed, for example, to draw on a globe the curve which contains the third and ninth antique hour line, that the figure may be more conveniently delineated, elevate the pole about 60° , and divide each semi-diurnal arc into two equal parts; a line drawn through the points of division is one bicrural branch of the curve; this branch terminates at a point in the greatest, always seen parallel; and to complete the curve the semi-diurnal arcs belonging to this point, considered as the mid-day point of a horizon, (forming the same angle with the equator as the first horizon, but on the other side), are to be divided into two equal parts, and the points of division being joined, a complete re-entering curve is formed on the surface of the sphere. A diameter of the sphere revolving,

with its extremity applied to this curve, forms the undulated conical surface; the portion of the diameter on the other side of the centre forms at the same time an opposite cone equal and similar.

The five undulated surfaces, each of which contains a pair of the antique hour lines, have each a different number of undulations.

At the same meeting a Paper was read by Dr. Jackson of St. Andrews, containing an elementary Demonstration of the Composition of Pressures.

June 17. Dr. Murray read a Paper entitled "A general Formula for the Analysis of Mineral Waters." The object of the paper was to give one method applicable to the analysis of all waters, instead of the diversity of methods hitherto employed.

Dr. Brewster laid before the Society a notice respecting some new discoveries on light. He found that water exists in nitrate of potash in the state of ice;—that the division of the pencil in doubly refracting crystals is produced by strata of different refractive powers; that one of the images becomes nebulous, as in the agate, when one set of the strata is broken down and irregularly disseminated among the other strata; and that in certain crystals any one of the two images may be rendered nebulous, or may even be extinguished by a particular process. This notice contained also a general view of the distribution of the polarising influence in tubes and cylinders of glass.

Cinchona Bark.

[From the London Medical Repository, for August, 1816.]

THE opinions of authors have very widely differed regarding the best species of this bark. The following is the substance of that of M. Hurtado, a Spanish physician, who has lately published an Essay on Intermittent and Remittent Fevers.*

* Annales Cliniques de Montpellier, tom. xxxix. p. 323.

The best cinchona is that of Loxa, a brown species, the bark of the cinchona *condaminea* of Humboldt and Bonpland. "It is distinguished, chemically, by its infusion decomposing tartar emetic, animal gelatin, gall-nuts, and sulphate of iron, independently of some other characters which are not found in the same degree in the other known species, and which are confirmed by the proportions and colours of the precipitates obtained." The best bark of this description is procured in the woods of Utizinga, Enatizinga, and Caxanuma. The second is the Kalysaya, or orange cinchona, the bark of the cinchona *lancifolia* of Mutis, the yellow bark of commerce; and when collected, dried, and preserved with care, is as valuable a febrifuge as the former kind. "It however," says Hurtado, "sometimes attacks the head, and occasions gripings;" but it produces excellent effects when mixed with the former species. The third kind is the cinchona commonly called huanuco, the bark of the *C. oblongifolia* of Mutis, the red bark of the shops. The Spanish physicians have very little esteem for this bark.

M. Hurtado assents with the opinion of the majority of authors, that cinchona is most efficacious when administered in the form of fine powder; and next to that he recommends an infusion obtained by the simple maceration of the bark in warm water.

M. Laubert has extracted from cinchona bark, by means of sulphuric ether, a greenish substance, which possesses many of the characteristics of bird-lime, and an essential oil of a very peculiar nature. In the superior kinds of cinchona this oil has the aroma of benzoin; in the common kinds, the colour is less agreeable, and the oily substance appears more allied to the resins than the volatile oils.

Extract from a letter on the best mode of softening Adhesive Straps.

[From the Edinburgh Medical and Surgical Journal, for July, 1815.]

THE custom of carrying up chafing-dishes with cinders in them, still in use in some hospitals, is highly objectionable, both on account of the offensive nature of the vapour to the patients, and of their answering their purpose imperfectly. All that is necessary, and what is used in most English hospitals, is a large tinned case, from a foot to a foot and a half in diameter, filled with hot water. The back of the strap is applied around the circumference of the case, and is retained there till the plaster be as much softened as you wish. The greatest advantage of this method of warming the plaster is, that it produces an equable heat, and at the same instant of time; of great consequence, particularly after amputations.

DISPENSARIES.

Two more Dispensaries have been established; one in the Northern Liberties and the other in the District of Southwark. They are formed on the same plan as the Philadelphia Dispensary. The increase and extension of population have made these additional institutions necessary, in order to afford suitable medical relief to the indigent part of the community.

UNIVERSITY OF PENNSYLVANIA.

THE Trustees have, in addition to those already established in the Seminary, instituted a Faculty denominated "*The Faculty of Natural Science*," to consist for the present, of the following Professorships:

1. A Professorship of Botany and Horticulture.
2. A Professorship of Natural History, including Geology, Zoology, and Comparative Anatomy.

3. A Professorship of Mineralogy and Chemistry, as applied to Agriculture and the Arts.
 4. A Professor of Natural Philosophy.
-

UNIVERSITY OF PENNSYLVANIA.

THE Medical Lectures will commence on the first Monday in November.

On Anatomy, by	Dr. Wistar.
Surgery,	Dr. Physick.
Practice of Medicine, &c.	Dr. Chapman.
Materia Medica,	Dr. Dorsey.
Chemistry,	Dr. Coxe.
Midwifery,	Dr. James.

CHEMICAL LECTURES.

JUDGE COOPER proposes to commence a Course of Chemical Lectures early in November. Due notice of time and place will be given.

LECTURES ON NATURAL HISTORY.

DR. CALDWELL will deliver, during the ensuing winter, a Course of Lectures on Natural History, Systematic and Philosophical, in which the several applications of the science to practical purposes will be particularly illustrated and enforced.

LECTURES ON NATURAL PHILOSOPHY,

BY DR. R. M. PATTERSON, M. D. Vice Provost, Professor of Natural Philosophy and Mathematics in the Collegiate Department, and Professor of Natural Philosophy in the Medical Department of the University of Pennsylvania.

Dr. Patterson intends to deliver a Course of Experimental Lectures on Natural Philosophy, during the ensuing winter, at the University, in Ninth-street. The Introductory Lecture

will be given on Monday, the eleventh of November, at seven o'clock in the evening; and the Lectures will continue on Monday and Thursday Evenings, at the same hour, until the beginning of March.



WINTER LECTURES ON BOTANY.

DR. BARTON'S Winter Course of Lectures on Botany and indigenous Vegetable Materia Medica, will commence the first week in November, and terminate in the first week of February.

The Winter Course is intended for the benefit of those Students of the Medical Class, and other persons, who do not continue in Philadelphia, during the Summer Lectures.



DR. RUSH'S Lectures, will commence on the first Monday in November.

RECENT BRITISH PUBLICATIONS.

MEDICINE.

An Analysis of the Mineral Waters of Tunbridge Wells, with some account of their Medicinal Properties; by Charles Scudamore, M. D. 8vo.

* Essays on Insanity, Hypochondriasis, and other Nervous Affections; by John Reid, M. D. 8vo.

Medical and Surgical Remarks; by Edward Granger, 8vo.
Reflections on Fever; by J. Calvert.

NATURAL HISTORY.

* An Introduction to Entomology, or Elements of the Natural History of Insects; by the Reverend William Kirby, R.A.F.L.S. and William Spence, Esq. F.L.S. illustrated by coloured plates.

Transactions of the Horticultural Society of London, part 4, vol. 2.

* A System of Physiological Botany; by the Rev. P. Ruth, F.L.S. with plates, 2 vols. 8vo.

General Zoology, or Systematic Natural History; commenced by the late George Shaw, M.D. F.R.S. &c. with Plates, from the first authorities and most select specimens, engraved principally by Mrs. Griffiths, vol. 9. 8vo.

PROPOSED BRITISH PUBLICATIONS.

DR. MARCET announces an Essay on the Chemical History and Medical Treatment of Urinary Calculi; with Plates.

Practical Remarks in Surgery, illustrated by cases; by A. Copland Hutchison, M. D.

Observations and Inquiries into the Nature of the Yellow or Bulam Fever, in Jamaica and at Cadiz, particularly in regard to its Primary Cause and Contagious Powers; by Mr. Doughty.

* These Works have been received by Mr. Dobson of this city.

RECENT AMERICAN PUBLICATIONS.

By Thomas Dobson,

A Synopsis of the various kinds of Difficult Parturition, with Practical Remarks on the Management of Labour; by Samuel Merriman, M. D. &c.; with Notes and Additions, by Thomas C. James, M. D. Professor of Midwifery in the University of Pennsylvania.

First Lines of the Practice of Physic. By William Cullen, M. D. late Professor in the University of Edinburgh—with Notes and Selections from Currie, Hamilton, Fordyce, Hunter, E. Home, Saunders, Baillie, and other celebrated writers—in two volumes, handsomely printed, and bound in one very large volume. Price three dollars.

A Treatise on Surgical Diseases, by the celebrated Baron Boyer, translated by Alexander H. Stevens, M. D. Professor of Surgery in the Medical Institution of New-York—two vols. with Plates. Price six dolls. in boards.

Medical Sketches of the Campaigns of 1812, 13 and 14—To which are added, Surgical Cases; Observations on Military Hospitals and Flying Hospitals. Also, an Appendix on Dysentery and Peripneumonia Notha. By James Mann, M. D. A. A. S. Hospital Surgeon of the Army, &c. &c. Price in boards, two dollars and fifty cents.

PROPOSED AMERICAN PUBLICATIONS.

Thomas Dobson, has in Press, and will publish in a few days,

Medical Histories and Reflections. By John Ferriar, M. D. Physician to the Manchester Infirmary, and Lunatic Hospital. Four volumes in one.

By Anthony Finley,

Engravings of the Bones, illustrating the Anatomy of the Human Body; by John Bell, Surgeon, quarto, containing 15 plates. Also, a *second edition* of Charles Bell's Engravings of the Arteries, royal 8vo. 12 coloured plates.

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